BRITISH MEDICAL JOURNAL

LONDON SATURDAY JANUARY 15 1944

CLINICAL FEATURES AND TREATMENT OF MALARIA IN BRITISH TROOPS IN WEST AFRICA

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"The symptoms of this fever, it is to be regretted, are so various and irregular, in different cases and under different circumstances, that a mere nosological definition of them would afford no precise information and might mislead those it was intended to instruct." Since Boyle in 1831 wrote these words in his gloomy *Account of the Fevers of Western Africa* the prognosis of subtertian malaria has greatly altered, but the diversity of its manifestations has not. Modern textbooks may claim to provide more than a mere nosological definition, but they tend to emphasize the severer and rarer types of the disease to the exclusion of its commoner and milder, though no less protean, forms. As the latter are prevalent in troops in West Africa at the present time and are not uncommon in those returning to this country, we believe that a fresh description of them may be of value. Pernicious types will receive little notice, as in our experience they occurred infrequently, and methods of investigation requiring more than the simple use of the microscope will hardly be mentioned.

The description is based on over 1,200 cases seen and treated by one or both of us in two military hospitals in West Africa in 1941 and 1942. Where figures are given these refer to 846 unselected cases in 584 patients from one hospital in each of which the diagnosis was confirmed by the finding of malaria parasites in the blood. In 380 cases the parasites were diagnosed as *Plasmodium falciparum*. In the remainder no diagnosis of the type of parasite was attempted, but it can be assumed for the purpose of this paper that all or nearly all were due to *Pl. falciparum*, since in no instance did the appearance of the parasite or the clinical features of the disease suggest the contrary, and workers in the district concerned agree that other types of malaria are rare, occurring, when they do, usually in visitors who have been infected elsewhere.

Our account deals with a group of white males aged 18 to 51 who had been passed as fit for oversea service, who were in most cases in a malarious district for the first time, and amongst whom the observance of antimalarial precautions and the taking of a suppressive drug were enforced, so far as they could be, by disciplinary measures. Further, in British West Africa subtertian malaria is for the most part hyperendemic and, on account of the climate and the varying habits of the principal anopheline vectors (*A. gambiae, A. gambiae* var. *melas*, and *A. funestus*), infections, though commonest in the wet season, occur all the year round. Conclusions based on the study of a particular type of patient in an area with particular characteristics are not necessarily applicable to other types of patient in other areas.

Previous Descriptions

We know of no previous account of the clinical features of malaria in white troops in West Africa. Small groups or single cases of the disease, acquired in West Africa but treated in England, have been described by Fawcitt (1940), Fawcitt and Walters (1941), Murray and Shute (1942), and Anderson and Bradshaw (1943); and treatment has been discussed by Hughes (1942), Hill (1942a, 1942b), and Hughes and Murgatroyd (1943).

The Clinical Types of Malaria

Malaria has been described as the great mimic of other diseases. To illustrate this fact, which is of great importance in diagnosis, we have divided our cases into clinical types, according to the principal feature of the attack, much in the same way as did Falconer and Anderson (1917) and Manson-Bahr (1920) in their respective descriptions of malaria in the Salonika and Egyptian Expeditionary Forces of the last war. While the exact pathogenesis of these types can only be a matter for speculation, it was noticeable that patients who had repeated attacks showed no predilection for a particular type of the disease.

The "types" described below accounted for 818 of our 846 cases. The remainder consisted of 24 particularly mild cases in which the patients had no fever and complained only of headache and slight malaise, and 4 cases with jaundice as the principal feature, which will be mentioned under the heading "Complications."

I. The Febrile Type

In this type (684 cases) fever itself was the main feature. The onset was usually quite sudden, with chilly feelings or shivering, soon followed by feverishness. During the hot stage, which lasted from 10 to 36 hours, the temperature was raised to 103 or 105°, and the patient complained of burning heat and great discomfort or was quite prostrated. In most cases this stage ended with profuse perspiration, a fall in temperature, and a sense of great relief, to be succeeded by an apyrexial interval, whose length was from a few to 36 hours and which often varied inversely with that of the preceding hot stage. While afebrile the patient felt quite well or complained only of slight headache. In some cases there was no apyrexial interval, and symptoms continued till the fever was controlled by an antimalarial drug.

During the febrile stage headache, backache, and generalized aches and pains were usually present. Pain in the back of the neck and aching across the shoulders, associated sometimes with stiffness in these regions, were common complaints, as were also aching in the eyeballs and pain behind the eyes, aggravated by moving them. Vomiting occurred in about a third of these cases in the febrile stage, and in some instances was very distressing, being accompanied by much retching. Some patients complained of abdominal pain, either diffuse or localized in the left hypochondrium or epigastrium, and others of pains in the chest which suggested intercostal myalgia or pleurisy or were of an indefinite nature. In some of the cases included in this type the symptoms were milder, and the patients had often remained at duty for several days before reporting sick.

Rigors occurred on only 22 occasions, and are therefore rare in malaria of this type. Their occurrence should suggest the possibility of the onset of blackwater fever and call for the keeping of a close watch on the patient and his urine.

II. The Gastro-intestinal Type

Gastric, diarrhoeic, and dysenteric forms were recognized.

(*a*) *Gastric.*—Vomiting was the principal feature in the 11 cases of this type. Epigastric discomfort, at times amounting to actual pain, and constipation were usual, and headache and backache were complained of on occasion. The fever was mild in all instances, and the vomiting differed from that which occurred in the febrile stage of cases of the previous type in that, though more persistent, it was less distressing and was not associated with retching. The symptoms were continuous or irregularly intermittent, except in one case in which they recurred on alternate days. Some of these patients were sent to hospital with a diagnosis of "dyspepsia" or "acute gastritis." In all instances the symptoms cleared up rapidly when antimalarial treatment was instituted.

Illustrative Case.—Sgt. T. was admitted to hospital with a history that four nights previously he had complained of nausea and vomiting, and these symptoms had continued all the next day. Two days before admission he had been free from symptoms and felt well till the evening, when nausea and vomiting returned. The symptoms had continued all the next day, and were associated with epigastric discomfort and complete anorexia. On the day of admission he felt better but weak. No malaria parasites were found in films of his blood. That night he complained again of epigastric discomfort, vomited repeatedly, and his temperature rose to 100.4°. On the following day his spleen was palpable, malaria parasites were present in blood films, and quinine bisulphate gr. 10 t.d.s. was prescribed. He made a rapid and uninterrupted recovery.

(*b*) *Diarrhoeic.*—The principal feature in the 60 cases of this type was simple diarrhoea, accompanied in most instances by colicky abdominal pain of varying severity. In a third of the cases this began suddenly, and was associated with headache of mild severity and vomiting of short duration. In the remainder diarrhoea, mild colicky abdominal pains, and a feeling of malaise had been noticed for several days before the patient felt ill enough to report sick. These patients had few symptoms apart from their intestinal ones, and were sometimes sent to hospital merely for the investigation of a diarrhoea which had failed to respond to the usual remedies. None had high fever and 11 of them had no fever while in hospital. The stools were watery, did not contain blood or mucus, and varied from 5 to 18 or more in the 24 hours. In the majority of cases the diarrhoea was continuous, but in some it occurred on alternate days. The stools were examined microscopically in every case; in the majority nothing abnormal was detected, but in about a quarter of them pus and red blood cells were present. They were cultured on a number of occasions, but no organisms of pathogenic significance were isolated.

Illustrative Case.—Pte. B. was admitted to hospital with a history of diarrhoea and colicky abdominal pain for six days. His motions had been watery and had numbered between seven and ten daily. He had never noticed blood or mucus, and did not complain of other symptoms. His temperature was 100.6°, pulse 74, and respirations 20. He had mild angular conjunctivitis, the lower edge of the liver was palpable and tender, but no other abnormal signs were present. During the first two days in hospital no malaria parasites were found in blood films; microscopical examination of the stools showed some pus and red blood cells only, and culture of them revealed no abnormality. On the third day malaria parasites were found and treatment with quinine was begun. The temperature became normal in 48 hours and the diarrhoea disappeared on the third day of treatment.

(*c*) *Dysenteric.*—In 12 cases of this type diarrhoea, with blood and mucus in the stools, was the main feature, and was accompanied by headache, fever of moderate severity, and abdominal pain. The onset was almost always sudden; the fever and constitutional disturbance were greater than in cases of the previous type and the diarrhoea was more profuse and distressing, as many as 30 motions being passed in 24 hours. Backache was complained of in a few cases; vomiting was unusual, and tenesmus quite exceptional. The stools were cultured repeatedly, but no pathogenic organisms were discovered.

Illustrative Case.—Sgt. G. was admitted to hospital with a history of diarrhoea, with blood and mucus in the stools, 25 having been passed in the previous 24 hours. He had complained of headache on the evening before admission and stated that he had had a temperature of 102° at the same time. On admission his temperature was normal and his tongue slightly furred; no other abnormality was discovered on physical examination, and no malaria parasites were found in blood films. The stools contained pus and red cells, but no pathogenic organisms were grown on culture. On the following day his condition was unaltered until the evening, when he complained again of headache and generalized aching and his temperature rose to 101°. On the third day his temperature was normal, but bloody diarrhoea continued and films were still negative for malaria parasites. On the fourth day malaria parasites were found in blood films, and quinine bisulphate gr. 10 was administered thrice daily. Three days later his bowels acted normally and thereafter he made an uninterrupted recovery.

We saw no case of malaria of an appendicular type in West Africa. We did, however, see one of true appendicitis in a patient with malaria. Since returning to this country one of us has seen a typical case of malaria simulating acute appendicitis. The presence of a leucopenia was the main differentiating feature, and the condition cleared up rapidly when treatment with quinine was started.

III. The Respiratory Type

In 39 cases the main clinical feature was an acute or subacute bronchitis, patients with a previous history of chronic or recurrent bronchitis being excluded from this group. The symptoms varied from the acute respiratory distress of an asthmatic attack to a moderate degree of cough and expectoration. Some fever was the rule, but in a few instances it was insignificant in degree or absent. The attack usually began abruptly with headache, backache, and generalized aching. After a variable period respiratory symptoms appeared. The cough, at first dry and unproductive, soon became looser, but expectoration was seldom profuse. Wheezing and vomiting occurred in some instances. Rales and rhonchi were heard on physical examination, and in a few cases the clinical picture suggested the presence of a bronchopneumonia; but radiographs of the chest did not confirm these clinical findings.

Illustrative Case.—S/Sgt. P. was admitted to a hospital with a history of a few hours' feverishness, headache, generalized aching, and vomiting. His temperature was 102°, pulse 88, and respirations 24. He was wheezing and had considerable respiratory distress. On examination of the chest numerous sibilant rhonchi were heard in all areas. Malaria parasites were present in a blood film, and quinine bisulphate gr. 10 t.d.s. was prescribed. Seven hours later he had a profuse perspiration, but wheezing continued and he was given a hypodermic injection of adrenaline with good effect. He was better next morning, with only slight wheezing, and expectorated abundant frothy sputum, but the same evening his acute symptoms returned. On the following day the sputum became mucopurulent and the spleen was palpable, but the symptoms abated. On discharge 12 days after admission he complained of slight cough only and the spleen was no longer palpable.

IV. The Myalgic Type

In 10 cases the main feature was muscular pain and stiffness. In six of them there was no fever and in three no more than slight fever. The onset was usually acute, with pain localized to the affected muscle or muscles, and constitutional symptoms were slight or absent. On examination the affected muscles were tender and in spasm, and active or passive movement caused acute pain. The muscles most often affected were the lumbar, the intercostal, and those of the neck, either singly or in combination. Rest, salicylates, and heat provided temporary relief; but only when malaria parasites were demonstrated in the blood and the appropriate treatment was administered did complete recovery ensue.

Illustrative Case.—Sgt. T. was admitted to hospital complaining of pain and stiffness of the right side of the neck that had come on suddenly two days previously. There were tenderness and spasm of the right sterno-mastoid and of the cervical portion of the right trapezius, and the condition differed in no way from an ordinary acute torticollis. No other abnormal physical signs were noted, and a blood film revealed no malaria parasites. Salicylates by mouth and radiant heat and massage were prescribed without beneficial effect. Two days later, as no improvement had taken place, further blood films were examined: malaria parasites were demonstrated, and quinine bisulphate gr. 10 t.i.d. was administered. The pain was much improved in 48 hours and the condition cleared up completely in five days. The patient had no other symptoms and was afebrile throughout.

V. The Cerebral Type

The 2 patients in this series had cerebral symptoms. The first was conscious, but was completely disorientated, had some motor aphasia, and was afflicted with severe muscular

twitchings. The second was delirious and gravely ill, with a dry brown tongue, a paralytic squint, and a left extensor plantar response. Both recovered completely.

General Features

The following features applied to some extent to all types of case.

Onset.—This was sudden in the majority of cases, but in a minority (152) was preceded by a prodromal period, lasting from a few days to a few weeks, of malaise, headache, lassitude, backache, or diarrhoea.

Symptoms.—The main symptoms of the attack, irrespective of type and in order of frequency, were headache (770), backache (486), shivering (253), vomiting (234), feverishness (233), pain in the back of the neck (184), generalized aching (180), slight cough (169), sweating (153), and simple diarrhoea (134). Constipation (61) was the exception.

Temperature.—Quotidian intermittent fever was seen in 45 cases; tertian intermittent in 49; subtertian intermittent in 53; irregularly intermittent in 87; remittent in 75; continuous in 27; "low fever" (pyrexia not exceeding 100°) in 91; and no fever throughout in 50. In 366 cases the fever did not last long enough to be of any special type.

Pulse Rate.—Relative bradycardia was a principal feature of the disease as seen by us in West Africa. An analysis of the pulse-temperature ratio is as follows:

Temperature	Corresponding Average Pulse Rate per Minute	No. of Observations made
105°	102·0	59
104°	97·2	177
103°	91·6	177
102°	86·5	177
101°	83·9	177
100°	79·2	177

Urine.—Albuminuria, varying from the presence of a trace to a heavy deposit in the boiled specimen, was reported on 10 occasions, and reduction of Fehling's solution in 17 cases. Both were transient features.

Physical Signs

The spleen was palpable on admission in 315 cases, at some time during the acute attack in 462 cases, and on discharge approximately two weeks after admission in 137. Tenderness in the splenic region was noted in 114 cases. The liver was abnormally palpable in 32 cases, the greatest degree of enlargement being to three inches below the costal margin; and tenderness of the liver on palpation was noted in 61. Diffuse abdominal tenderness was noted in 19 cases and slight abdominal rigidity in 7. The tongue was usually moist and clean, and was never more than slightly furred in uncomplicated cases. Angular conjunctivitis in some degree was not uncommon, and a faint icterus of the conjunctivae without noticeable involvement of the skin was seen occasionally. Rhonchi were heard in the chest in 136 cases, sometimes accompanied by rales.

Complications

Chronic Malaria.—Out of 584 patients 6 were considered, after several acute attacks, to be suffering from chronic malaria. Such patients usually complained of chronic headache, fatigability, and general ill-health. They looked sallow, had some degree of splenomegaly—the spleen being harder in consistency than that commonly felt in acute attacks—an anaemia of slight to moderate degree with leucopenia and a relative lymphocytosis, and had often lost weight. In many instances of so-called "chronic malaria" the objective signs were slight, the symptoms appeared to be mainly emotional, and simple psychotherapy was more needed than drugs.

Blackwater Fever.—Four patients out of 584 developed this complication, and two of them died.

Jaundice.—Definite jaundice was seen in 11 cases and slight icterus of the conjunctivae in 14. Three types of jaundice were recognized: (i) The acute haemolytic jaundice of blackwater fever. (ii) Slight icterus of the conjunctivae only, which was present during the acute attack and was presumably due to slow haemolysis. (iii) Jaundice, usually of moderate severity, with clay-coloured stools and dark urine, indistinguishable clinically from catarrhal jaundice or infective hepatitis. In four cases this was present on admission, and in two it appeared during treatment with mepacrine. As in at least two cases, not included in this series, similar jaundice appeared during treatment with quinine, it is unlikely that mepacrine was responsible for it.

Herpes labialis occurred in 41 cases and herpes nasalis in 5.

Generalized urticaria occurred in 3 cases—in two during treatment and in one at the onset of the attack.

Severity and Prognosis

In less than 10% of these cases could the patient be described as severely ill and in less than 1% as dangerously ill. Of those described as severely ill the majority were simply patients who responded unusually slowly to treatment, and these probably corresponded to the 12% of patients shown by Howie and Murray-Lyon (1943) to absorb or metabolize abnormally quinine given by mouth, as disclosed by the irregular occurrence or absence of positive Tanret reactions in the urine. Out of 584 patients 14 (2.4%) were invalided home, the indications being chronic malaria (7), recovery from cerebral malaria (2), recovery from blackwater fever (2), anaemia (1), persistent jaundice (1), and haemolytic jaundice of uncertain origin (1). There were no deaths from uncomplicated malaria. Two patients out of 584 died from blackwater fever—a mortality rate for the whole series of 0.34%.

We believe our account to show that, given favourable conditions, malaria in West Africa at the present time need not enjoy the evil reputation that it has. The disease is potentially a very dangerous one, and its apparent mildness may occasionally prove its most subtle danger; but unnecessary exaggeration of the dangers of the average case causes needless alarm and contributes to disability from "tropical neurasthenia."

Diagnosis

Films were usually taken at 12- to 24-hourly intervals, and in 968 cases parasites were found at the first examination in 57%, at the second in 22%, at the third in 5%, at the fourth in 3%, and at the fifth and sixth in under 1% (an "examination" for this purpose meaning the search of a thick film for not less than 10 minutes); while in 13% parasites were not found and the condition was treated as "clinical malaria."

When the clinical findings are equivocal it is wise to examine repeated blood films, but the above figures show that parasites will usually be found, if they are going to be, in the first two or three examinations. With us the apyrexial interval was as favourable as any other time for the finding of parasites, for out of 816 positive films 389 were taken when the patients were afebrile.

While films are being taken for the diagnosis of equivocal cases *in hospital* the administration of a suppressive drug should be discontinued, as the parasites are then more likely to be found. We have never seen any harm come of this practice. Patients in hospital for any other purpose should continue to take their suppressive drug, and patients undergoing surgical operations should be given 10 gr. of quinine or 0.1 g. of mepacrine daily. If this is not done an attack of malaria two or three days after the operation is not uncommon, and at best adds considerably to the patient's discomfort.

Treatment

In a district of the type described here it is likely that most residents become and remain infected with malaria. Many of them must be regarded as living in a state in which the forces of infection and of resistance are in a somewhat precarious balance, and a clinical attack may result from anything which serves even temporarily to reduce the powers of resistance—such, for instance, as a surgical operation, an intercurrent infection, or an interruption of suppressive treatment. Since there is at present no known drug treatment that will terminate human infections and there is reason to believe that immunological processes play a considerable part in their control (Coggeshall, 1943), the objects of treatment in such an area must be to aid natural resistance to the disease and by the use of drugs to suppress or abort clinical attacks.

While little is known of the nature of the immunological processes involved, it is reasonable to suppose that they will be aided by the maintenance of a high standard of general health, and in practice measures to this end do appear to be important. In our experience ambulant patients or those treated in their own quarters did not regain a feeling of well-being as quickly as those kept in hospital for an adequate period, and they had a greater tendency to early relapse, though the same course of drugs may have been administered in each case. We had an impression that the same applied to patients receiving an unnecessarily large dosage of drugs. Whatever drugs are given patients should, except in an emergency, be treated in hospital and should remain there for a minimum of 12 to 14 days. It is false economy to treat patients otherwise or to cut short their convalescence.

We believe that this principle could be carried further and that the provision of convalescent camps in West African stations is a measure which would save its own cost by reducing disability from malaria. Such camps should be situated in relatively healthy areas, preferably with facilities for bathing and other recreation; and convalescence in them should be planned, and should include graded exertion so that return to normal duty does not involve a sudden unaccustomed strain. The *Medical History of the War, 1914–18*, describes the provision of such camps as "a practice which obtained recognition during the war," and states that convalescence should last at least three weeks.

Treatment of the Acute Attack

In the height of the fever patients were nursed in blankets. Warm sponging, drying, and changes of clothing as often as necessary added considerably to their comfort. The disadvantage of sedatives is that they usually produce profuse sweating without relief of symptoms. We began by treating all our patients with a full course of quinine, mepacrine, and pamaquin, under the assumption that the more "thorough" the treatment the less likely was the occurrence of relapses. This assumption was not justified, for we found that our return cases were no less numerous than anyone else's. We next tried treating the patients in one ward with quinine followed by pamaquin, and those in another with mepacrine followed by pamaquin. We found that patients in the quinine–pamaquin ward became apyrexial and free of symptoms quicker than those in the mepacrine–pamaquin ward, but thought that return cases were less common in the mepacrine–pamaquin ward than in the quinine–pamaquin one. We next abandoned pamaquin for routine use because:

(i) It is doubtful whether pamaquin has any anti-relapse value in malignant tertian malaria (Sinton and Bird, 1928).

(ii) The destruction of gametocytes, which pamaquin does achieve, is of little importance in Europeans in a hyperendemic area where there is a huge reservoir of infection in the native population.

(iii) Cyanosis and abdominal colic occurred in a few of our patients under treatment with pamaquin.

(iv) Haemoglobinuria had been reported in patients under treatment with pamaquin (Sinton, Smith, and Pottinger, 1930; Mann and Smith, 1943), and we heard of a few recent cases of blackwater fever during administration of this drug.

(v) We were unable, as was not the case with quinine and mepacrine, to demonstrate to ourselves that in the treatment of our patients pamaquin had any value other than the destruction of gametocytes.

After abandoning the use of pamaquin we settled on a routine course of quinine by mouth for two days (sometimes extended to three if the fever had not fallen to below 100° at the end of 48 hours), followed by mepacrine for six days. This modification produced no evident deterioration in our results; patients who had been treated by the earlier methods stated that they felt better after the modified course, and the proportion of cases returning within three months was distinctly less after this treatment than after the previous ones. Quinine was given as a solution of such salts as were available, in doses of 10 gr. t.i.d. if necessary in an acid mixture. Mepacrine was given in doses of 0.1 g. t.i.d. If vomiting occurred we substituted for the usual quinine mixture quinine bihydrochloride in tablet form, and found that this could be taken in most cases.

We used quinine by injection in all cases considered to be suffering from pernicious forms of the disease, in a few cases in which even tablets of quinine bihydrochloride were vomited, and in very occasional and quite exceptional cases (less than 1%) which did not appear to be responding to quinine by mouth. The *routine* use of quinine injections, as suggested for instance by Wingfield (1943), even granted that a higher proportion of severe cases may be seen in England, seems to us excessive and unnecessary.

As our patients were kept in hospital for 12 to 14 days in any case we did not give quinine and mepacrine simultaneously; but there is no objection to this practice, and as mepacrine acts slowly it may with advantage be begun 24 hours before quinine is discontinued. If mepacrine alone is used the initial doses should be greater than 0.1 g., but the optimum dosage for this purpose remains to be determined. We have recently used an initial dose of 0.8 g. followed by 0.1 g. t.i.d. in a few cases in England with good results.

As soon as the course of treatment was completed our patients returned to their usual suppressive dose of quinine or mepacrine.

Treatment of Pernicious Attacks

These must always be regarded as medical emergencies, and should be treated promptly and, in the initial stages, by injection. We do not propose to enter into the controversy as to the best route for the injection of quinine. We used both intravenous and intramuscular injections on occasion without encountering ill effect. In a patient who is conscious and can take quinine by mouth and absorb it (as shown by the Tanret test in the urine) nothing was gained, in our experience, by giving more than two or at most three parenteral injections. In comatose patients or those unable to take or absorb drugs given by mouth, parenteral injections must be continued till the symptoms are controlled. Intravenous glucose and saline may be necessary to prevent dehydration. In a few cases we tried reconstituted plasma as suggested by Fawcitt, and considered the results promising. In patients with cerebral malaria who failed to respond to other measures therapeutic lumbar puncture seemed to be of value.

Suppressive Treatment between Attacks

The taking of a small dose of so-called "prophylactic" quinine has been customary among Europeans on the West Coast for at least a century, and is strongly recommended by most local practitioners of experience. This measure is undoubtedly of some value, and is considered essential for troops under active-service conditions. In practice the results are not quite according to theory, and a varying degree of individual susceptibility appears to be of importance; for some individuals can go for long periods with no suppressive drugs and have little or no malaria, while others have repeated attacks in spite of them.

In dealing with troops under active-service conditions exceptions cannot be made, and the taking of a suppressive drug on parade and under the supervision of an officer is enforced. It is likely that mepacrine will replace quinine for this purpose in troops in West Africa, and according to Hill (1942a, 1942b) doses of 0.1 g. daily can be taken with good effect and without the appearance of toxic manifestations. It is important that persons leaving malarious districts of this type should be instructed either to continue with their normal dose of suppressive drug for at least two months after they have left the area, or to continue this dose for two weeks and then take mepacrine 0.1 g. thrice daily for five or six days.

Summary

846 unselected cases of malaria in British troops in West Africa, every one confirmed by the finding of parasites and presumably almost all subtertian in type, were divided according to the principal clinical feature of the attack into febrile, gastric, diarrhoeic, dysenteric, respiratory, myalgic, and cerebral types.

While its apparent mildness may occasionally prove the disease's most subtle danger, under the conditions stated, which included compulsory personal antimalarial precautions and taking of suppressive drugs, the prognosis in ordinary cases was excellent, while pernicious attacks and complications were very rare. Only 2 patients died, both from blackwater fever, and 14 were invalided home.

After various modifications in treatment the routine use of pamaquin was abandoned. The most generally useful course of drugs in uncomplicated cases was found to be quinine gr. 10 t.d.s. by mouth for two or three days, and mepacrine 0.1 g. t.d.s. for six days, the two drugs being with advantage "overlapped" for 24 hours. The patient's usual dose of a suppressive drug was resumed as soon as the course was finished, and an adequate period of convalescence was regarded as of the greatest importance.

Our thanks are due to Col. O. J. O'Hanlon, officer commanding a military hospital, for permission to publish this article; to Cols. John McFadden and A. McKie Reid for according us facilities for the investigations; to Major I. B. Morris for most of the pathological investigations; to Major J. W. Howie for helpful criticism; and to Dr. A. M. Gillespie, Senior Medical Specialist, Accra, for advice on many occasions.

REFERENCES

Anderson, W. L., and Bradshaw, D. B. (1943). *British Medical Journal*, **1**, 508.
Boyle, J. (1831). *A Practical Medico-historical Account of the Western Coast of Africa*, p. 127, London.
Coggeshall, L. T. (1943). *Medicine*, **22**, 87.
Falconer, A. W., and Anderson, A. G. (1917). *Lancet*, **1**, 607.
Fawcitt, J. D. (1940). *Lond. Hosp. Gaz.*, **44**, 9.
—— and Walters, A. H. (1941). *British Medical Journal*, **1**, 14.
Hill, T. R. (1942a). *Trans. roy. Soc. trop. Med. Hyg.*, **36**, 70.
—— (1942b). Ibid., **36**, 75.
Howie, J. W., and Murray-Lyon, R. M. (1943). *Lancet*, **2**, 317.
Hughes, W. (1942). *Trans. roy. Soc. trop. Med. Hyg.*, **36**, 60.
—— and Murgatroyd, F. (1943). *Lancet*, **1**, 699.
Mann, W. N., and Smith, S. (1943). *Trans. roy. Soc. trop. Med. Hyg.*, **37**, 151.
Manson-Bahr, P. (1920). *Lancet*, **1**, 79.
—— (1922). In *History of the Great War. Medical Services: Diseases of the War*, **1**, p. 276, London.
Murray, J. E., and Shute, P. G. (1942). *Lancet*, **2**, 365.
Sinton, J. A., and Bird, W. (1928). *Indian J. med. Res.*, **16**, 159.
—— Smith, S., and Pottinger, D. (1930). Ibid., **17**, 793.
Wingfield, A. (1943). *British Medical Journal*, **1**, 770.

DESPECIATED BOVINE SERUM (D.B.S.): A SUBSTITUTE FOR HUMAN PLASMA

BY

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The use of plasma in surgical treatment is increasing rapidly, and further studies of the condition of hypoalbuminaemia and its relation to post-traumatic and post-suppuration cachectic states and to delayed wound-healing envisage a still greater demand for plasma protein therapy. The panels of donors and blood banks organized throughout the country have hitherto provided a convenient supply of a protein solution, but the investigation of an alternative source is indicated in view of the future need for this material.

Any plasma substitute must have the following characteristics: (*a*) it should be retained in the circulation and eventually be metabolized; (*b*) it should exert an osmotic pressure equivalent to that of plasma; (*c*) it should be non-toxic, free from antibodies, and non-antigenic. An attempt to produce such a material was made by Bayliss in 1916, when he introduced 6% gum-acacia in saline as a substitute for blood in the treatment of shock (Bayliss, 1917). This material had a very considerable efficiency, but it was only partially metabolized. Much of it remained permanently in the tissues, and many unpleasant sequelae occurred (Hanzlik and Karsner, 1920; Maytum and Magath, 1932; Yuile and Knutti, 1939; Andersch and Gibson, 1934).

Other organic substances suggested have been isinglass (Taylor and Waters, 1941), pectin (Hartman *et al.*, 1941), gelatin (Gordon *et al.*, 1942), and methyl cellulose (Hueper, Martin, and Thompson, 1942); but they must be absolutely pure, and in the case of the first three this standard is very difficult to obtain. Furthermore, the effective metabolism of such foreign material is very much in doubt. More recently periston (polyvinyl pyrollidon) has been put forward in Germany (Hecht and Weese, 1943); it has a very high osmotic action, and the claim is made that it will remain in the circulation for two days and be excreted in 3 to 4 weeks. All these substances may have some beneficial effect in maintaining blood volume in shock and haemorrhage, but will have little or no value in restoring loss of blood protein.

The substance most nearly approaching human plasma protein in character, and one which is available in quantity, is animal plasma protein. Unlimited quantities may be obtained in the abattoirs in the form of animal serum. A comparison of the protein constituents of human blood with those of the blood of the animals of which practical use may be made is shown in the following table (Howe, 1925):

	Human	Cow	Horse	Sheep
Total protein, g. % ..	7·49	7·43	6·10	5·74
Fibrinogen ,, ..	0·30	0·72	0·34	0·36
Globulin ,, ..	2·73	3·50	2·49	2·31
Albumin ,, ..	4·45	3·21	3·27	3·17
Albumin/globulin ratio	62·0/38·0	47·8/52·2	56·6/43·4	57·1/42·9

In total protein, bovine blood most nearly approaches human blood, but there is a much higher percentage of fibrinogen, which, however, is eliminated in the preparation of the serum. Howe's figure for the total protein of bovine blood refers to elderly animals, bullocks usually having a much higher content than this (see below). The albumin/globulin ratio is lower, too, in bovine blood, which might result in a lower osmotic pressure than with human serum, as the albumin fraction, having a smaller molecule, exerts the greater pressure. As bovine serum is obtainable in the largest quantity, however, this material has been utilized in the following investigation.

Administration of Animal Sera

The infusion of animal sera of full protein content has up to the present been generally unsatisfactory, owing to the high percentage of unfavourable reactions. Kremen and his co-workers (1942) recently gave crude bovine serum an extensive clinical trial in 120 cases, and have declared it unsuitable for general use for the following four reasons: (1) all recipients must be tested by an intradermal dose, positive reactors (approximately 50%) to which do not take the serum well; (2) approximately 60% of the recipients have an immediate reaction after infusion of less than one pint; (3) serum sickness developed in 60% of those cases to which it was possible to administer any quantity of the serum; (4) the rate of administration was so slow as to be practically useless in shock. These authors attempted, furthermore, to absorb the agglutinins on to washed human red cells by mixing these with the serum; but this was only partially successful, and there was a tendency to haemolysis of the human red cells. The incidence of immediate reactions decreased somewhat, but serum sickness was just as prevalent.

Characteristics of Crude Bovine Serum

Crude bovine serum is orange in colour and of a slightly higher viscosity than human serum. We have found the total protein content to vary between 7.5 and 9.5 g.%, the higher figure being obtained in bullocks (Folin and Ciocalteau's colorimetric method). The values for sugar, chlorides, non-protein nitrogen, and potassium were approximately the same as for human serum. *In vitro* tests showed that when bovine serum was mixed with 50 different samples of human red cells of all groups agglutination occurred rapidly. The titre of this agglutination factor in bovine serum is almost constantly 1/16, and this would not permit of more than 200 c.cm. being administered rapidly with safety to any human being. Furthermore, haemolysis of the human red cells is very definite after a period of one hour. These tests bear out the statement of Kremen *et al.* as to its unsuitability for human administration.

Removal of the Globulins

As most of the antibodies are known to be attached to the globulins, removal of this fraction might leave a solution of albumin which could safely be given to man. To this end we took samples of bovine serum and precipitated the globulin fraction by half saturation with sodium sulphate. The resulting filtrate was then dialysed in cellophane cylinders against water, leaving behind a solution of albumin. This albumin was passed through a Seitz filter and collected in sterile bottles. A test of the solution showed that there was no agglutination of human red cells. The *p*H was 7.8.

This albumin solution was administered slowly to two volunteer patients suffering from advanced carcinoma of the

bronchus. In the first a severe rigor occurred ofter 50 c.cm., and typical serum sickness and an extensive urticarial rash 7 days later. In the second a rigor occurred after 40 c.cm., but no serum sickness. This material also was obviously unsuitable for human administration in quantity. It is possible that the albumin was not totally free from globulin, as it is most difficult to separate the last remaining fractions (Cohn, 1941), but it is also possible that this is a true protein reaction due to the albumin itself. Davis, Eaton, and Williamson (1942), however, have prepared a bovine albumin solution by precipitating the albumin by full saturation with ammonium sulphate and re-dissolving the precipitate. This solution was administered by them to 13 patients without reaction. Similarly, Cohn (1941) and Cohn *et al.* (1942) have precipitated out the albumin fraction with 40% ethyl alcohol at −5° C., and suggested the use of this product. No clinical results are yet obtainable, but Cohn states that, from the physio-chemical point of view, the molecules of human and bovine albumin are remarkably similar.

Antibody Destruction

The danger of giving animal sera to man is, first, the presence of agglutinins; secondly, the presence of haemolysins; thirdly, the development of serum sickness with its distressing manifestation some six to eight days later; and, fourthly, the development of anaphylaxis, precluding the further administration of a similar serum after 10 days' time without careful desensitization.

All these factors must be disposed of before the serum is suitable for human administration, but to be effective in the treatment of shock the osmotic action of the protein must be maintained. Of the physio-chemical methods of antibody destruction, the available precipitation methods have been described. At the present time cost is a considerable item, particularly with the use of alcohols, but it is obvious that further investigations on these lines may be very profitable. Of the physical methods, cold is known to preserve the antibodies, but the practical possibilities of their destruction by heat have not received much attention.

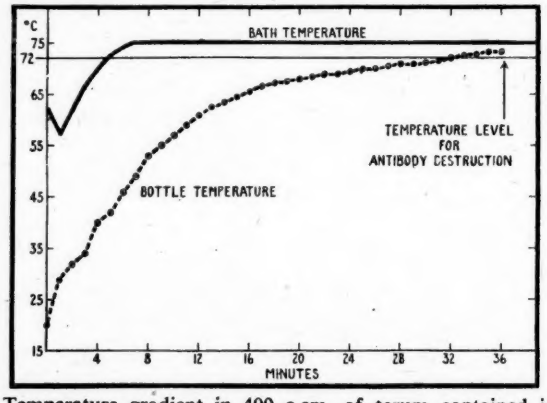
In a short paper (Edwards, 1943a, 1943b) I described a method of destroying the antibodies of bovine serum by controlled heating, so that the resulting product was tolerated by man. The following account gives in greater detail the method of producing this material, and its pathological and biochemical investigation.

The heating of crude bovine serum causes, at a temperature of 70° C., a milkiness, leading on to total coagulation of the whole protein content at 72° C. Destruction of the agglutination factor starts at about 60° C., is complete between 70° and 71° C., and appears to be directly related to changes in the protein complex. Heat coagulation of the serum can be prevented by the addition of a small amount of formalin and ammonia. The technique adopted consisted of adding 0.20% by volume of liq. formaldehydi, shaking, and then adding 0.20% by volume of 0.88 ammonia. Any excess formaldehyde is converted by the ammonia into hexamine, which is innocuous. At 70° C. the normal Tyndall effect of the serum increases slightly, suggesting that there is some agglomeration of protein molecules, but no precipitation occurs. Ultracentrifuge results show that the globulins have partially disappeared at 60° C., and that at 70° C. the serum consists almost entirely of albumin.

With many samples of bovine serum, when formalin and ammonia have been added and it has been heated to 70° C. or above, there is a tendency for the protein element to form a clear "gel." This tendency to gelatification has been noted before in association with formolized sera after incubation for some days (Jacobs and Sommers, 1939), but it is also likely to be observed when ammonia alone is added. This gelatification is certainly an indication of some degree of denaturation of the protein, and is probably related to the phenomenon of coagulation. The "gel" formation can be prevented by adding to the serum before heating 1/4 to 1/5 of its volume of normal saline, and it is important to test the sample from each animal for this propensity to gelatinize. It can be done by adding to a few c.cm. of serum in a test-tube the appropriate quantity of formalin and ammonia and then immersing in a water-bath at 75° C. Gelatification is noted by tipping the test-tube, when the fluid is seen to have a gelatinous consistency in the major part. On shaking, too, the air bubbles rise only slowly to the surface. Serum which has gelatinized is quite unsuitable for intravenous administration, as the "gel" is held up by simple filtration. The change in colour of the serum is a good indication that efficient "processing" has taken place. The orange colour changes to a dichroic greenish tinge, which is quite characteristic.

Details of Preparation

Blood may be collected at the abattoir. After killing, the animal is suspended on chains and the head lifted. The neck is slit across, opening the great vessels, and the blood is allowed to pour into the sterile collecting-vessel. Autoclaved bread tins have been found to be the most useful containers for this purpose. This method of collection is admittedly open to criticism, as absolute sterility cannot be ensured, but from the practical point of view it has been found quite satisfactory. From 16 to 20 pints may be obtained from each animal. Cannulization of the jugular vein in living animals is quite easily performed, but only about 8 pints can be obtained every two months by this measure. The blood is allowed to form a firm clot (taking about 20 minutes) before it is transported. It is kept at room temperature for two hours, and then the tin is placed slightly canted on one side in a refrigerator. After three days the serum is drained off into Winchesters and passed through wood pulp to remove any remaining erythrocytes. A small sample can then be taken and tested for "gel" formation as described. The serum is finally passed through a double Seitz filter. If gelatification has occurred in the sample tested, saline dilution is necessary before the Seitz filtration; if, however, the filtration is being undertaken through a standard plasma-filtration unit, then enough saline will be picked up in the apparatus to provide the requisite dilution to prevent gelatification. (CO_2 must not be used in the plant as a pressure agent, as this converts the ammonia, added later, to ammonium carbonate.) The filtered serum is collected in units of 400 c.cm. in standard transfusion bottles with perforated screw caps and rubber diaphragms. The requisite amount of formalin and ammonia is added by injection through the cap. Sterility tests can be undertaken at this stage. The bottles are then placed in a water-bath at 60° C. (to prevent cracking of the glass), and the temperature is raised rapidly to 75° C. This temperature is maintained for 30 minutes, during which time the serum will have been heated to approximately 73° C. (see Graph). (This technique has



Temperature gradient in 400 c.cm. of serum contained in a standard M.R.C. transfusion bottle while immersed to a depth of 16 cm. in a water-bath at 75° C.

been worked out for the standard M.R.C. blood transfusion bottle, and would of necessity have to be modified for any other form of container. The essential factor is that the serum must reach a temperature of 73° C.) On cooling, the serum is ready for use. The term "despeciated bovine serum" (D.B.S.) is now given to the material.

Physical Characteristics of and Tests with Despeciated Bovine Serum

D.B.S. has a greenish tinge, with a more definite Tyndall effect than the original serum. The total solid content is as before the processing, but if saline dilution has been performed

it is proportionately reduced. The protein content after preparation through the standard plasma-filtration plant is approximately 5 g.%. The *p*H is 8. After processing, D.B.S. gives the standard simple chemical tests for protein. Quantitative tests may be undertaken colorimetrically by the biuret test or by the usual gravimetric tests. Chemical tests suggest that the solution is a mixture of albumin and an agglomerated form of protein. The crystalloids are unaffected by the processing.

A hundred samples of human cells belonging to different groups were mixed with D.B.S. There was no tendency to agglutination in any sample up to 12 hours, either macroscopically or microscopically. This test was repeated with 20 groups of cells at 0° C. and 37° C., but no agglutination occurred. Group AB human serum was added to a further series of suspensions of human cells in D.B.S. to see if the addition of further complement would induce agglutination, but this test was also negative. The results of these tests suggest that the agglutinins in the bovine serum have been destroyed: that the agglutinins have been destroyed by heat and not by formalin and ammonia is shown by the fact that if these substances are added to crude serum, and it is not heated, agglutination takes place as before. Haemolysis of human red cells when mixed with D.B.S. does not occur under 48 hours, and then only very mildly.

D.B.S. and the "gel" form were injected into rabbits subcutaneously, intramuscularly, and into the body cavities in quantities up to 6 c.cm. The animals were totally unaffected, and, on killing after three weeks, absorption of both materials was found to be complete, with little evidence of tissue reaction in the muscles or subcutaneous tissue and no evidence of adhesions or inflammatory reaction in the body cavities.

Osmotic Pressure Determinations

On the osmotic pressure exerted depends the whole value of the substitute. Osmotic pressure readings were taken by the micro-method of Krogh and Nakazawa against mammalian Ringer solution. The values for the human material are the average of a number of different samples, and depend upon the protein content.

Osmotic Pressure Readings (mm. H_2O)

Human serum	292
Human plasma (crude)	181
Human plasma (filtered)	151
Crude bovine serum	280–340
Bovine albumin solution (globulin precipitated)	200
Despeciated bovine serum	120–160

It is thus seen that D.B.S. as prepared on a large scale has an osmotic pressure comparable to that of filtered plasma.

Storage

Samples of D.B.S. were kept for a period of 9 months in a refrigerator to see if any change occurred during this time. To all tests *in vitro* it appeared as inert after this period as the freshly prepared material, and on subsequent clinical trial no deleterious change was manifest. No alteration was noted in its consistency and no precipitation of any material. Long-period tests show, too, that D.B.S. may safely be kept at room temperature: two bottles of this material have travelled in my car for 6 months without apparent deterioration, being subsequently administered to a patient without incident.

Transmission of Disease to Man

There is the possibility of the transmission of *B. tuberculosis* and *Br. abortus* to man if they happen to be present in the bovine blood. The finding of organisms in the blood stream in these animals is rare, but during the dissemination of the disease they almost certainly are present, and it is possible that the animal may be bled during one of these stages. Thirty per cent. of all cows that come to the slaughter-house have been infected by tuberculosis or abortus fever. In bullocks and heifers, however, the infection rate is only about 6%, and it is advisable to use these animals exclusively, or, ideally, to use tuberculin-tested stock only. During the processing the Seitz filtration should remove any of these organisms, and as a final check the meat inspector's report on the carcase of the animal from which the blood has been obtained should be sought. Any gross infection of the animal with tuberculosis would suggest the advisability of discarding that particular blood.

Preliminary Clinical Trial

D.B.S. has been given a preliminary clinical trial in 26 cases, particulars of which appear in the accompanying Table.

No.	Disease	Amount Given	Time	Reactions
		c.cm.		
1	Carcinoma of thymus ..	400	2 hours	Nil
2	,, bronchus ..	400	1 hour	,,
3	,, ,, ..	400	30 mins.	,,
4	,, ,, ..	400	30 ,,	,,
5	Carcinoma ventriculi ..	400	20 ,,	,,
6	,, ,, ..	400	20 ,,	,,
7	Carcinoma of breast ..	400	45 ,,	,,
8	Chr. empyema with hypoproteinaemia	(a) 1,200 (b) 1,200 (3 weeks later)	6 hours 6 ,,	Pyrexia 100°
9	Carcinoma of breast ..	400	1 hour	Nil
10	Post-operative shock; amputation of leg	1,200	45 mins.	Vomited. Pyrexia 100°. ? Post-operative
11	Shock; extraperitoneal rupture of bladder	1,200	30 ,,	Nil
12	Carcinoma ventriculi ..	400	20 ,,	,,
13	Carcinoma of bronchus ..	400	20 ,,	,,
14	,, ,, ..	400	30 ,,	,,
15	,, oesophagus	400	30 ,,	,,
16	,, bronchus ..	400	30 ,,	,,
17	,, ,, ..	400	1 hour	,,
18	Acute empyema	(a) 1,200 (b) 1,200 (3 days later)	6 hours 6 ,,	,,
19	Chronic ,, ...	800	3 ,,	,,
20	Lung abscess and empyema	800	4 ,,	,,
21	Carcinoma ventriculi ..	400	1 hour	,,
22	Acute empyema	800	3 hours	,,
23	,, ,, ...	1,200	4 ,,	,,
24	,, ,, ...	800	3 ,,	,,
25	Chronic ,, ...	2,400	20 ,,	,,
26	Acute ,, ...	1,200	5 ,,	,,

Two of the cases may be described in more detail:

Case 8.—Bilateral empyema of 2 years' standing. Plasma protein 6 g.%. Oedema of legs and ankles for 6 months. Mild amyloidosis. 6–12 g. of albumin in urine per day. 1,200 c.cm. of D.B.S. caused a marked polyuria with disappearance of oedema. Oedema slowly returned in ankles only. 3 weeks later 1,200 c.cm. of D.B.S. given. Oedema disappeared again, and 1 month later, although slight oedema of the ankles had returned, the patient declared that his legs had completely lost the heavy feeling. Plasma protein now 6.2 g.%. Albuminuria persists. The D.B.S. appears to have exerted a considerable osmotic action in this case, although, of course, owing to the albuminuria the result was only temporary.

Case 10.—Aged 41. Amputation of leg for sciatic nerve paralysis with marked trophic changes. Pre-operative condition good. No sepsis. Seven hours after the operation the pulse rate had risen to 140. There was no bleeding from the stump, and the patient appeared to be developing post-operative shock. Although the blood pressure was still 100/70, it was decided to administer D.B.S. After 1,200 c.cm., given in 45 minutes: pulse 110, blood pressure 130/95. Eight hours later: pulse 110, blood pressure 120/90. This infusion produced a satisfactory sustained rise in the blood pressure and fall in the pulse rate. (Administration and readings by Mr. W. M. Beattie, R.S.O., Liverpool Royal Infirmary.) Uneventful recovery.

Conclusions

The clinical trial of D.B.S. so far undertaken would indicate that it is safe to administer to man, and is unassociated with any severe form of reaction. No rigors were observed, and serum sickness and delayed reactions were absent even after large quantities. Slight temperature rises were noted in some patients, but on no occasion above 100° F. No clinical evidence of intravascular haemolysis has been observed and no haemoglobinuria seen.

The urine was tested in all cases for protein, and where this had previously been absent it was not found. No marked increase of protein occurred in those patients who had a pre-infusion albuminuria. This would suggest that the protein does not pass through the renal capillaries, and no evidence was forthcoming that it passed out of any other capillaries in the body. It is reasonable to suggest that it is well retained in the circulation. The osmotic pressure effects are difficult to assess, but the result in the case of hypoproteinaemia with oedema suggests that this is considerable. Where there was large and rapid protein loss, such as in the acute empyema cases, the administration of D.B.S. was marked by an immediate feeling of well-being on the part of the patient. Anaphylaxis so far has not been encountered, and has been deliberately tested for in 10 patients.

The solution is easily prepared, is available in enormous quantities, is completely stable, and can be stored at room temperature. It may be administered very rapidly and in large amounts, and no patient seems to have been adversely affected by its introduction.

More detailed haematological and biochemical studies of the effect of its administration in the state of shock, hypoproteinaemia, and protein deprivation and loss are being undertaken, and final judgment must await these results. Despeciated bovine serum would, however, appear to accord with the three precepts given at the beginning as being necessary for a plasma substitute, and as such may have a useful place in the treatment of conditions in which human plasma protein has been of value.

Summary

Substitutes for human plasma hitherto prepared have not fulfilled the three criteria: (*a*) retention in the circulation and eventual metabolism; (*b*) exertion of an equivalent osmotic pressure; and (*c*) non-toxicity, non-antigenicity, and freedom from antibodies.

Bovine serum can be made safe for man by destroying the antibodies by heating to 72° C., while rendering the proteins uncoagulable with the addition of 0.2% of formalin and ammonia. Material so prepared appears to accord with the above precepts.

Clinical trial in 26 cases shows that it can be administered rapidly and in large amounts to man with safety.

My grateful thanks for much practical help and advice are due to Prof. O. Herbert Williams, Prof. T. B. Davie, Prof. H. J. Channon, and the late Prof. J. F. Craig. To Prof. T. B. Davie I am also deeply indebted for placing the facilities of the Regional Transfusion Laboratories at my disposal. Very valuable technical assistance has been given to me by Herbert Gutfreund, B.Sc., who also prepared the solutions of bovine albumin. The ultracentrifuge runs were kindly undertaken by Dr. Ogston of Cambridge. The preparation of D.B.S. has been continuously in the hands of Mr. Harold Nevin, technical assistant in the department of surgery. Finally I am indebted to Dr. A. J. McCall, pathologist to the North Staffordshire Royal Infirmary, Stoke-on-Trent, for the "idea" of adding formalin and ammonia to serum to prevent coagulation.

REFERENCES

Andersch, M., and Gibson, R. B. (1934). *J. Pharmacol.*, **52**, 390.
Bayliss, W. M. (1917). *Proc. roy. Soc.*, B, **89**, 380.
Cohn, E. J. (1941). *Chem. Rev.*, **28**, 395.
—— *et al.* (1942). In *Blood Substitutes and Blood Transfusion*, p. 173, ed. by Stuart Mudd and William Thalhimer. Charles C. Thomas, Springfield, Ill.
Davis, H. A., Eaton, A. G., and Williamson, J. (1942). *Proc. Soc. exp. Biol., N.Y.*, **49**, 96.
Edwards, F. Ronald (1943a). *Proc. roy. Soc. Med.*, **36**, 337.
—— (1943b). *Bull. War Med.*, **4**, 24.
Gordon, H., Hoge, L. J., and Lawson, H. (1942). *Amer. J. med. Sci.*, **204**, 4.
Hanzlik, P. J., and Karsner, H. T. (1920). *J. Pharmacol.*, **14**, 379.
Hartman, F. W., Schelling, V., Harkins, H. N., and Brush, B. (1941). *Ann. Surg.*, **114**, 212.
Hecht and Weese (1943). *Münch. med. Wschr.*, **90**, 11. Quoted by *Bull. War Med.*, M.R.C., 1943, **3**, 511.
Howe, P. E. (1925). *Physiol. Rev.*, **5**, 439.
Hueper, W. C., Martin, G. J., and Thompson, M. R. (1942). *Amer. J. Surg.*, **56**, 629.
Jacobs, J. L., and Sommers, S. C. (1939). *J. Immunol.*, **36**, 531.
Kremen, A. J., Hall, H., Koschnitzke, H. K., Stevens, B., and Wangenstcen, O. H. (1942). *Surgery*, **11**, 333.
Maytum, C. K., and Magath, T. B. (1932). *J. Amer. med. Ass.*, **99**, 2251.
Taylor, N. B., and Waters, E. T. (1941). *Canad. med. Ass. J.*, **44**, 547.
Yuile, C. L., and Knutti, R. E. (1939). *J. exp. Med.*, **70**, 605.

TREATMENT OF ANAEMIA IN SCHOOL-CHILDREN WITH IRON AND ASCORBIC ACID

BY

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AND

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In a previous survey of the haemoglobin levels of a cross-section of the population in Edinburgh (Davidson *et al.*, 1942) subnormal haemoglobin values were found in approximately 40% of children from municipal schools as compared with only 4.5% of children examined at private schools. Accordingly a therapeutic test was undertaken in order to evaluate the effect of adding supplements of iron and ascorbic acid to the diet of the municipal-school children. The results of this experiment have been submitted to Dr. A. Bradford Hill for statistical analysis, and the statement that a significant rise in the mean haemoglobin values has occurred in any of the experiments outlined below is based on that analysis. In each experiment the initial haemoglobin levels of the control and experimental groups were not significantly different. The tests were carried out in three municipal schools on children from 5 to 12 years of age.

School I

The children in both the control and the experimental groups were unselected, but were divided into three groups according to whether they took school or home midday meals. Group A consisted of children who went home for a midday meal; Group B included those who took school dinners, for which they paid; while Group C included those children who had free school dinners. The children in the experimental groups were given 3 gr. of ferrous sulphate in tablet form daily for 5 days a week. Haemoglobin estimations were made at the outset of the experiment and again after three months of treatment. The results of the experiment are shown in the accompanying Table.

Table showing Mean Hb % in Control and Experimental Groups

		Total	Treatment Received	1st Examination	2nd Examination	3rd Examination
School I:						
Group A	Control	77		85·4	84·6	
	Exptl.	85	Ferrous sulphate 3 gr. daily	85·3	87·0	
„ B	Control	32		77·9	80·1	
	Exptl.	44	„ „	80·3	85·9	
„ C	Control	41		82·2	82·6	
	Exptl.	45	„ „	80·7	86·3	
School II:						
	Control	57		81·7	80·8	
	Exptl. A	56	Asc. acid 25 mg. daily	82·4	82·0	
	Exptl. B	57	Asc. acid 25 mg. daily + ferrous sulph. gr. 3 daily	82·4	83·8	
School III:						
	Control	27		78·0	81·2	88·3
	Exptl.	27	Asc. acid 25 mg. daily + ferrous sulph. gr. 6 daily	77·8	87·3	93·5

Conclusions

(*a*) *Control Groups.*—There was no significant rise in the mean haemoglobin levels at the second examination.

(*b*) *Experimental Groups.*—In all three groups the mean haemoglobin levels at the second examination after three months of treatment were significantly higher than the corresponding figures for the control groups. In Groups B and C there was also a significant rise in the haemoglobin levels at the second examination as compared with the original haemoglobin values. In Group A, although there was a rise in the haemoglobin values, it was not statistically significant.

(*c*) An analysis of the haemoglobin figures of those children whose initial haemoglobin level was less than 80% showed that of 59 such children in the control series 31 (52.5%) still had haemoglobin figures of less than 80% at the second examination; while of 71 receiving iron therapy, only 24 (33.8%) still had haemoglobin figures of less than 80% at the second examination. This improvement in the treated group is statistically significant.

School II

(*a*) Control Group: total, 57 unselected children. (*b*) Experimental Group A: total, 56 unselected children; treated with 25 mg. of ascorbic acid daily for 5 days a week. (*c*) Experimental Group B: total, 57 unselected children; treated with 25 mg. of ascorbic acid daily and 3 gr. of ferrous sulphate daily for 5 days a week. Haemoglobin estimations were made at the outset of the experiment and again after three months of treatment.

Conclusions

(*a*) *Control Group.*—There was no significant rise in the haemoglobin values when the estimations were repeated at the end of three months.

(*b*) *Experimental Group A.*—There was no significant rise in haemoglobin levels after three months of treatment with ascorbic acid as compared with the initial haemoglobin values or with the control group.

(*c*) *Experimental Group B.*—There was a significant rise in the haemoglobin levels of the children on iron and ascorbic acid after three months of treatment as compared with the

control group, but the increase over their own initial haemoglobin values was not significant.

(*d*) An analysis of the haemoglobin figures of those children whose initial haemoglobin level was less than 80% showed that out of 26 in the control series 15 (57.7%) still had haemoglobin figures of less than 80% at the second examination; of those receiving ascorbic acid alone, 19 had haemoglobin levels below 80% at the first examination, and at the second examination 13 (68.4%) were still below 80%; while of those receiving iron and ascorbic acid 19 were below 80% at the first examination, but only 4 (21.1%) were below 80% at the second examination. The improvement noted in this last group is statistically significant.

School III

Only children whose original haemoglobin level was 80% or less were included in this experiment. (*a*) Control group. total 27. (*b*) Experimental group: total 27.

The children in the experimental group were given 25 mg. of ascorbic acid daily and 6 gr. of ferrous sulphate in tablet form daily for 5 days a week. It should be noted that the dosage of iron was double that given in Schools I and II, and the children were selected because clinical anaemia was present. Treatment was given for six months. Haemoglobin estimations were made at the outset of treatment and repeated at intervals of three and six months.

Conclusions

(*a*) *Control Group.*—A significant rise in haemoglobin levels was found at the second and third examinations as compared with the levels found at the first examination.

(*b*) *Experimental Group.*—This series also showed a significant rise in haemoglobin levels at the second and third examinations. The mean levels in this treated group were, however, significantly greater than those found in the control group at the second and third examinations.

Discussion

Investigations into the Hb levels of large numbers of persons in different areas of Great Britain, including Aberdeen (Davidson *et al.*, 1935) and Edinburgh (Davidson *et al.*, 1942), have clearly demonstrated the frequency with which anaemia occurs in infants, school-children, and women, both pregnant and non-pregnant. The anaemia is almost universally of the hypochromic type, which responds excellently to iron therapy. It leads to a feeling of fatigue and exhaustion, to a loss of appetite, and to a reduction in efficiency. In the case of the infants it has been shown to be associated with an increased liability to infection. The family doctor should constantly be on the watch for the development of anaemia in his patients. The improvement in their general well-being which will rapidly result from the administration of the ferrous salts of iron will amply reward him for the time spent on making the necessary examinations. For the prevention of anaemia, reliance should be placed primarily on securing an adequate intake of iron by instructing the patient to eat sufficient quantities of the foodstuffs which are particularly rich in the mineral. By so doing the intake of other important factors connected with haematopoiesis—e.g., protein and vitamins B and C—will be coincidently improved. In this connexion we wish to draw attention to the value of national wheatmeal bread made of 85% extraction flour. Its content of iron is 0.7 mg. per oz., compared with 0.3 mg. per oz. for white bread made from 70% extraction flour. On an average intake of 6 oz. of bread daily an addition of more than 2 mg. of iron daily is consumed. Investigations which will be published shortly suggest that this increment during the past eighteen months has already made a significant contribution to the reduction of anaemia in school-children. Nevertheless, under wartime conditions it may on occasion be necessary to supplement the diet with medicinal iron.

The investigations reported in this paper clearly indicate that the administration of iron in doses of approximately one-third of that usually prescribed for curative treatment can significantly improve the haemoglobin levels of school-children. The increases shown in the Table are admittedly small. It might accordingly be asked whether any significant improvement in health could be expected to result therefrom. It should be pointed out, however, that the figures given represent mean values. In the municipal-school children in Edinburgh the average haemoglobin figure was found to be 80%. Accordingly approximately half of the children had a haemoglobin level above this figure and half below it. It would be unreasonable to expect such small doses of iron to affect materially haemoglobin levels of normal or only slightly subnormal ranges. A study of individual cases showed this to be the case. It should be noted incidentally that when two tablets were given daily, as in School III, the mean haemoglobin was brought up to 93%. In the case of children whose haemoglobin was below 80%, and particularly when they were in the neighbourhood of 70%, a rise of 10 to 15% regularly followed the administration of one tablet of fersolate daily. It was due to these increments that the mean haemoglobin level was raised. Few would question the advantages to the health of school-children of such an increment.

It should be noted that the experiments recorded in this communication were essentially prophylactic in nature, and it must be clearly understood that in the treatment of individual cases of anaemia much larger doses of iron should be given.

Our knowledge of the aetiology, incidence, and treatment of iron-deficiency anaemia is now so complete that the medical profession must shoulder the responsibility if the necessary measures for its control are not widely adopted.

Summary

Experiments conducted over periods of three to six months indicate that a supplement of iron, even in such small amounts as 3 gr. of ferrous sulphate once daily for 5 days a week, can produce a significant rise in the haemoglobin levels of municipal-school children.

This suggests that the hypochromic anaemia of these children is mainly conditioned by an insufficiency of iron in the diet.

A supplement of 25 mg. of ascorbic acid daily had no effect in raising the haemoglobin levels.

We wish to express our thanks to Dr. Bradford Hill for his statistical help, and to Messrs. Glaxo Laboratories Ltd. and Roche Products Ltd. for their generosity in supplying free the supplements of iron and ascorbic acid respectively; and also to the Medical Officer of Health for Edinburgh and the staffs of the municipal schools, whose assistance was much appreciated.

REFERENCES

Davidson, L. S. P., Donaldson, G. M. M., Lindsay, S. T., and McSorley, J. G. (1943). *British Medical Journal*, **2**, 95.
—— Fullerton, H. W., and Campbell, R. M. (1935). Ibid., **2**, 195.

THE INFLUENCE OF SUPPLEMENTS OF VITAMINS A, B_1, B_2, C, AND D ON GROWTH, HEALTH, AND PHYSICAL FITNESS

BY

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This is a summary of a vitamin feeding test carried out in 1941-2 on approximately 1,400 school-children and adults. A full report of the test has been prepared, but it is too lengthy for publication.

Towards the end of 1940 the Ministry of Health accepted a gift of multi-vitamin capsules from a group of United States physicians to carry out a feeding test on suitable groups of people. The time was opportune, and the capsules were employed as test material to ascertain whether a supplement of synthetic vitamins to the ordinary diet would improve growth, health, and physical efficiency. Each capsule contained:

Vitamin A	4,000 i.u.	Ascorbic acid ..	1,000 i.u.
Thiamin	333 i.u.	Nicotinamide ..	20 mg.
Riboflavin	2 mg.	Vitamin D	600 i.u.

Three of the five tests carried out were done on school-children and two on factory workers. Four times during the tests the vitamin content of the capsules was checked and found up to specification by the Medical Research Council. The school tests were performed on elementary-school children in Ipswich, Glossop, and London. The number of children who completed the test was 1,242: Ipswich, 425 boys and girls aged 5 to 13; Glossop, 370 boys aged 9 to 13; London, 447 boys

aged 9 to 14. Of the London children 123 were boys aged 9 to 14 living in a camp school.

The tests began in Nov./Dec., 1941, and ended in July/Aug., 1942. The school-children were examined before, during, and after the period of feeding. They were divided at random into two equal groups according to school, age, and sex; one group received a vitamin capsule every school day, and the other a capsule containing a similar quantity of arachis oil, which is practically devoid of vitamins. Records were kept of all illnesses, of their nature and duration. The medical examination included examination of the teeth and gums by dentists—in London by T. S. Rodgers.

The factory tests were conducted at the zinc-smelting works at A and L, where the labour is extremely strenuous and exhausting. The men work in gangs of five or six, and the average output of zinc for each gang is weighed daily. In factory A 12, and in factory L 24, gangs of workers were divided at random into a vitamin and a control group. Each man received an appropriate capsule six days a week. The naked weight was taken monthly before the men began work. Haemoglobin and blood pressure were also measured at regular intervals, and the output of zinc and all absences due to illness were recorded.

The findings for the children were similar in all four places. During the period of observation the vitamins had no statistically significant effect on the rate of growth, nutritional status, muscular strength, condition of the teeth and gums, or absence from school on account of illness. Muscular strength was measured in London and Glossop by a dynamometer like that described by Hill, Magee, and Major (*Lancet*, 1937, **2**, 441); it was not done in Ipswich. In Glossop alone a special test of endurance by hanging on a bar was done. Both the controls and the vitamin children improved in endurance, and the improvement shown by the vitamin children was greater than that shown by the controls. In view of the relatively small number of Glossop children tested, we feel that this particular finding should be strictly limited in its application to that group of children. Similar findings would have to be obtained in other areas before any wider application of the Glossop results could be regarded as justifiable. Feeding tests with this object were started on several thousand children three months after the conclusion of the above tests, and are still in progress.

In the factory tests on 214 adult men, the results showed that the vitamin capsules had no significant effects on weight, haemoglobin, blood pressure, absence from illness, or output of material. The conditions of the test in the factories, however, were such that only relatively large differences in output would have been revealed.

Many people assisted us in conducting these feeding tests and analysing the results, but lack of space forbids individual acknowledgment of their help. A mass expression of thanks to all who co-operated is all we can make in this summary.

UMBILICAL HERNIA IN CHILDREN

WITH SPECIAL REFERENCE TO INJECTION TREATMENT

BY

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Umbilical hernia is classified into three types—congenital, infantile, and adult. There is no disagreement as to the treatment of the extremely rare congenital type, or exomphalos: all are agreed that it is only possible to save the infant from peritonitis by operating within a short period after birth. I have successfully operated on an infant within four hours of birth for an extensive exomphalos containing much large and small intestine: the defect in the abdominal wall was closed by the Mayo method, and it was surprising how the scar later contracted down and almost resembled a normal umbilical cicatrix.

The infantile and adult types are both of acquired origin, but they are regarded as being quite separate diseases. The general impression is that umbilical hernia rarely occurs in adolescence and early adult life. It is true that surgery is seldom requested for umbilical herniae at this period of life, because, if present, they are small and do not bother the patient much. Few mothers will fail to seek medical attention for a large umbilical hernia in a child. The adult patients one has to deal with are more commonly females than males, and the preponderance of females appears proportional to the greater incidence of adiposity in the female sex. Although the patients are over 40 years of age they usually state that they know the hernia has been present many years; but the onset is always vague and insidious. It is therefore impossible to establish any clear relation between the presence of an umbilical hernia in childhood and one in later life.

Clinical Features of Infantile Umbilical Hernia

The mother nearly always states that the hernia has dated from soon after birth, but occasionally a latent interval up to four months has been noticed. There is no history of any gross sepsis of the umbilical stump. The infant, either male or female, is often poorly developed, and is more likely to be suffering from rickets than the very rare condition of cretinism. It is important to keep in mind the possibility of increased intra-abdominal pressure due to ascites or intestinal obstruction, etc. The majority, however, have no obvious predisposing cause, but sometimes inguinal hernia is also present: adiposity apparently is not associated with infantile umbilical hernia. The infants are presented at a surgical out-patient department from 8 weeks old upwards, but the majority are about 18 months old when they arrive, having failed to respond to treatment by strapping.

Treatment

Paterson and Gray (Barrington-Ward, 1937) found that out of 214 cases at the Hospital for Sick Children, Great Ormond Street, 101 disappeared without operation, but all writers say that the longer the hernia has been present and the larger the neck, the less likely will it be cured without operation. Few spontaneous cures occur after the age of 3 with support. As spontaneous cure with support occurs in nearly half the cases I thought injections would increase the proportion of, and hasten, cure in selected cases with small necks. My results seem to show that injections can cure umbilical hernia in such cases. The advantage of the treatment is that it may avoid operation and admission to hospital, and can therefore be advised for debilitated infants and children with small herniae. I think the main disadvantage is that the temperament of young children is rather unsuited to repeated injections if one is insufficient. There appears to be no risk of injecting into the peritoneal cavity.

Injection treatment of inguinal hernia was first practised by George Heaton (1877) of Boston, Mass., about a hundred years ago, but was later perfected by Ignatz Mayer of Detroit. Delisle Gray (1932), who advocated Mayer's technique, brought the method and the results before the medical profession in England. So far as I can ascertain from literature and hearsay evidence there have been few cases of umbilical hernia treated in this way. Burdick and Coley (1937), out of a total of 92 cases, treated only one umbilical hernia by injection, and the result of this was not stated. Wyss (1929), Larson (1934), and Quillin (1934) reported favourably on the result of injecting umbilical herniae, but they were all mainly concerned with adult inguinal hernia. Bratrud (1937) illustrated his technique of injections for umbilical hernia, and stated that by this method they were more favourable than even in indirect inguinal hernia. Personally, I have not yet tried injections for inguinal hernia because the many attendances for injections at an out-patient department would entail as much lost work as with operative treatment, and if the patient was not cured at the end of the time both patient and employer would be dissatisfied. With regard to inguinal hernia in children, the operative treatment is so safe, with recurrence and sepsis almost unknown, that I have not yet been tempted to try injection treatment. There is no doubt that even inguinal hernia can sometimes be cured by a truss in childhood—e.g., the famous case of Sir Astley Cooper (Murray, 1910), which was verified at his necropsy, when only a minute sinus canal was found extending to the tunica vaginalis. In spite of this, operative treatment is indicated because of the rarity of spontaneous cure.

It is the accepted view that umbilical hernia in children is nearly always curable with a support, but the cases seen

in hospital do not seem to respond to strapping. The cases of umbilical hernia I selected for injection had necks the smallest diameter of which was one-third of an inch or less. Most of the cases had been sent to me because strapping had failed.

Technique of Injection Treatment

An anaesthetic is not essential for young infants; a little ethyl chloride anaesthesia, however, is very helpful, because voluntary movements are controlled, but the sac still remains distended, so that it can be avoided. I have used up to 4.5 c.cm. of 5% phenol in almond oil at one injection. The solution is injected into the subcutaneous tissue as near the neck as possible without risk of puncture of the peritoneum. At a subsequent injection, if this is required, it is much harder to inject the solution. After injection it is essential to keep the hernia reduced. A small round pad of gauze is held in position by elastoplast applied right round the body like a belt at the level of the umbilicus. This support should be continued after the injections have ceased, because the scar tissue produced by the sclerosing fluid becomes more strain-resistant as time progresses. Animal experiments (Crohn, 1937) have shown that the phenol solution produces tiny areas of necrosis, which are later followed by more intense fibrous reaction than that seen when other solutions have been tried.

I would like to emphasize the method of applying elastoplast as a complete belt. Beadnell (1942) has suggested applying elastoplast to one half of the abdomen as far as the midline while the nurse pushes the other half of the rectus muscle towards the middle. Beadnell admits that his method produces a fold of skin in the midline, so there will be no effective antero-posterior support and very little pull on the two rectus muscles when the child cries or strains. The belt method of application keeps the hernia effectively reduced without any skin-chafing, and it will give much more support to the hernia owing to fixation from the lumbar spine. Mothers of babies with umbilical hernia nearly always state that they have noticed that the baby has cried less than before, and the belt method has certainly not reduced the baby's appetite or increased its liability to vomit. I strongly recommend this method of support, even for the youngest babies, as soon as umbilical hernia is noticed. The ordinary binder slips either up or down and it has to be removed daily for bathing, so the hernia is not kept permanently reduced.

Results of Injection Treatment

With ages ranging between nearly 3 months and 5 years, 42 out of a total of 62 cases of infantile umbilical hernia were selected for injection treatment and 63 injections were given. 26 cases needed only one injection; 11 cases had two injections, but two of these were submitted to operation later because the hernia showed insufficient diminution in size; 4 cases had three injections, and only 1 case had four injections, but this resulted in a cure. Out of the 42 cases selected for this treatment 31 were apparently completely cured when seen later, excluding the 2 cases cured by operation after unsuccessful injections; 2 cases were untraced, but it was not certain that the remaining 7 were finally cured, although when last seen they were responding well and there was very little umbilical bulge.

Subcutaneous Ligature

This minor operative procedure is recommended by Fraser (1926) for small umbilical herniae, and especially if they occur in slightly debilitated children who might not stand the radical procedure. The same author states that he has had no recurrence in hundreds of cases. Others, including myself, have not found this method so certain, because there has been a recurrence after an interval. It is probable that I would have found it more successful if I had combined subcutaneous ligature with a post-operative belt support.

Radical Cure

Most writers state that the radical method is the only certain way of curing umbilical hernia if the patient is over 3. It is required, however, for large herniae below that age. Barrington-Ward (1937) does not advise the Mayo type of repair, because there is no wide separation of the fascia, and yet he states that the recti are separated. It is curious that I cannot find any textbook which mentions that the hole in the fascia is more often elliptical, with the long axis transverse; in fact, it can often be described as a transverse slit. Surely this shows that the Mayo type of closure of the fascia is better, just as it has proved better in adults. In children it is unnecessary to excise the umbilicus with an elliptical area of skin as in the Mayo operation for adults, because the hernia is reducible.

After opening the sac at its neck it is often possible to sew up the peritoneum separately. The aponeurotic opening is then closed by mattress sutures with overlap. The most difficult part of the operation is dissecting the fundus of the sac off the deep aspect of the umbilicus without buttonholing it or leaving a portion of the sac behind. My impression is that it is better to buttonhole the skin than to leave any endothelial lining, which predisposes to haematoma formation and sepsis in spite of drainage. Recently I have not drained the wound but have applied elastoplast as a belt after the operation. This procedure obliterates any dead space, and appears to have reduced the incidence of slight wound sepsis. Because of the danger of collapse of the lung Fraser does not recommend this operation before the age of 3. Apart from local sepsis, which delays convalescence, I have had no complications, although I will undertake operation in much younger patients if the hernia is large. I have performed the radical operation in 30 children, with two recurrent cases, during the same period as the cases that were selected for injection treatment.

Conclusions

Infantile umbilical hernia should be treated as early as possible with elastoplast applied as a belt with a small pad. After the age of 3 months the combination of injection and support will give a large percentage of cures even if strapping has failed in about two-thirds of the cases sent to the surgeon. Ambulatory treatment is desirable if possible in children, because of the frequent shortage of children's beds through infectious diseases and because of the risk of cross-infection. The injection treatment appears safe if done under short general anaesthesia.

REFERENCES

Barrington-Ward, Sir L. (1937). *Abdominal Surgery of Children*, London.
Beadnell, L. M. M. (1942). *British Medical Journal*, **1**, 565.
Bratrud, A. F. (1937). *Ann. Surg.*, **105**, 324.
Burdick, Carl G., and Coley, B. L. (1937). Ibid., **106**, 322.
Crohn, N. N. (1937). *J. Amer. med. Ass.*, **108**, 542.
Fraser, John (1926). *Surgery of Childhood*, London.
Gray, St. G. Delisle (1932). *British Medical Journal*, **2**, 12.
Heaton, George (1877). *The Cure of Rupture*, Boston.
Larson, L. M. (1934). *Minnesota Med.*, **17**, 703.
Murray, R. W. (1910). *Hernia*, J. and A. Churchill, London.
Quillin, L. J. (1934). *Int. J. Med. Surg.*, **47**, 394.
Wyss, F. (1929). *Schweiz. med. Wschr.*, **59**, 85, 265.

Medical Memoranda

Dienoestrol for Menopausal Symptoms

The chemical formula and physical properties of dienoestrol ($\gamma\delta$-di-*p*-hydroxyphenyl-$\Delta^{\beta\delta}$-hexadiene) were recorded by Dodds, Golberg, Lawson, and Robinson (1938), and Campbell, Dodds, Lawson, and Noble (1939). Zuckerman (unpublished communication), working on monkeys, found that dienoestrol when given by injection was much less potent than the naturally occurring oestrogens. Emmens (1938) found that when this compound was given to mice by mouth it had the greatest activity, relative to subcutaneous dose, of any oestrogen examined up to that time.

A clinical trial with dienoestrol was carried out by me (Barnes, 1942). The compound was used for the inhibition of lactation, and its effect for this purpose was compared with that of stilboestrol and hexoestrol. The results showed that when given by mouth dienoestrol is a potent oestrogenic substance, and inhibition of lactation was obtained with one-tenth of the dose required in the cases of stilboestrol and hexoestrol. It was clear that further clinical trials were desirable to establish the value of dienoestrol as an oestrogenic agent, and it was therefore decided to try its effect in relieving menopausal symptoms.

Hawkinson (1938) as a result of the study of 1,000 women who were undergoing a natural or artificially induced menopause found that 75% suffered from distressing symptoms, but that considerable relief could be given by the administration of naturally occurring oestrogens. This has been the experience of many workers, and it has been found that the synthetic oestrogens are equally successful in relieving the symptoms.

The results are not easy to evaluate, as the symptoms complained of are largely subjective. In the present series an attempt was made to follow the patients' progress by means of repeated vaginal smears, but, unfortunately, the records are incomplete in this respect, partly because the patients were erratic in their attendances at the clinic.

THE PRESENT INVESTIGATION

The clinical results obtained in this small series may be summarized as follows: A total of 13 patients received treatment with dienoestrol, all for menopausal flushing or senile vaginitis. Two must be discounted, as they attended the clinic only once and were not seen again.

Of the remaining 11 five were having a natural menopause; one had had a surgical menopause for endometriosis at 38 years; two had had hysterectomy (presumably without removal of both ovaries) 14 and 15 years ago respectively; three had had a radium menopause. The symptoms and signs were: seven had hot flushes only; two had signs and symptoms of senile vaginitis; two had both conditions.

The results of treatment with dienoestrol, using a dose of 0.1 mg. by mouth twice daily for one or more periods of four weeks, were as follows: Hot flushes relieved or cured, 7 cases; hot flushes slightly relieved, but responded better to stilboestrol (1 mg. twice daily), 1 case; hot flushes not relieved by dienoestrol but cured by stilboestrol (1 mg. twice daily), 1 case. Larger doses of dienoestrol would probably have been effective in these two cases. Senile vaginitis was relieved or cured in all the four patients treated for this condition.

As already mentioned, an effort was made to obtain objective evidence of the effects of treatment by means of serial vaginal smears. A smear was taken at each attendance—that is, every four weeks. In three patients the senile change was not sufficiently advanced before treatment was begun to say that there had been any change. In three others there was definite evidence of an oestrogenic effect, but in the remaining five the changes were too indefinite to warrant any conclusion.

All the patients were carefully questioned for toxic effects. None experienced nausea or vomiting. One patient had a slight vaginal haemorrhage. One other patient stated that the tablets "made her feel depressed," and she stopped taking them. Her hot flushes were subsequently relieved with stilboestrol.

CONCLUSIONS

It is unfortunate that it has not been possible to make these tests in a larger series of menopausal patients. The results obtained in this small group indicate, however, that dienoestrol is a safe and non-toxic oestrogen; and it is to be hoped that it will be possible for other workers to carry out more extensive trials.

This investigation was carried out in the Obstetric Unit, University College Hospital, on behalf of the Therapeutic Trials Committee of the Medical Research Council. Pressure of other duties has prevented my testing dienoestrol in a larger series of menopausal cases, and the present Memorandum is therefore published mainly as an encouragement to other workers to continue the tests.

I am indebted to Messrs. Boots Pure Drug Co. Ltd., British Drug Houses Ltd., and Glaxo Laboratories Ltd., for supplies of dienoestrol.

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REFERENCES

Barnes, J. (1942). *British Medical Journal*, **1**, 601.
Campbell, N. R., Dodds, E. C., Lawson, W., and Noble, R. L. (1939). *Lancet*, **2**, 312.
Dodds, E. C., Golberg, L., Lawson, W., and Robinson, R. (1938). *Nature*, **141**, 247.
Emmens, C. W. (1938). *J. Physiol.*, **94**, 22 P.
Hawkinson, L. F. (1938). *J. Amer. med. Ass.*, **111**, 390.

"Inspiratory Borborygmi" as a Sign of Diaphragmatic Hernia

The diagnosis of diaphragmatic hernia has been made with increasing frequency in recent years, and it has come to be recognized as a not uncommon cause of obscure respiratory and abdominal symptoms. The symptoms are, however, in no way distinctive, and signs are in many cases indefinite or entirely lacking. As a result these patients are often wrongly diagnosed, and may even be subjected to operations without the true nature of the condition being recognized. Harrington (1938) found that in a series of 123 cases of diaphragmatic hernia an average of 3 previous erroneous clinical diagnoses had been made, and operations for gall-stones and gastric ulcer had frequently been carried out without relief. Diseases of the thorax, abdomen, or blood (hypochromic anaemia) may be simulated, and for this reason diaphragmatic hernia has been termed the "masquerader of the upper abdomen." In a case recently under my care the diagnosis was suggested by a sign which I have not seen previously described.

CASE RECORD

The patient, a woman of 74, was admitted to St. Nicholas Hospital complaining of cough and dyspnoea. She gave a history of migraine from puberty to the menopause, and strangulated inguinal hernia 10 years ago. Apart from this she was well till 5 years ago, when she began to have attacks of cough and breathlessness lasting 4 to 6 weeks at a time and recurring about once a year. An attack was preceded by a grunting noise in her stomach which she felt with each breath. She also suffers occasionally from pain in the left chest and back. For the last 8 months she has been increasingly short of breath on exertion, and if she eats a big meal she has abdominal pain and a sense of suffocation, and has to sit down and rest for a time. Several days before her admission to hospital she noticed the usual grunting noise in her stomach. This was followed by vomiting and diarrhoea, and later by cough and dyspnoea. A few days after her admission the attack had passed off, but she complained of pain in her left chest passing through to the back. On examination she was found to be a fairly well nourished woman. She lay flat in bed and was in no obvious distress. A grunting, borborygmus-like sound synchronous with inspiration could be constantly heard coming from her abdomen during the examination. With the stethoscope this sound was found to be most readily audible over the left lower chest and epigastrium. It ceased when the patient held her breath or sat up. Physical examination, apart from some moist sounds at the bases of the lungs, was negative. The blood pressure was 160/85.

FIG. 1.—Antero-posterior view. Hernia can be seen lying behind lower part of heart shadow.

FIG. 2.—Lateral view. Hernia is seen to pass up into the posterior mediastinum in front of the oesophagus.

A barium meal revealed a shadow superimposed on the lower part of the heart shadow in the supine position (Fig. 1). In the erect position it was seen to empty during expiration and fill with barium from below at each inspiration. The hernia was observed to contain a portion of the cardiac end of the stomach and to be situated in the posterior mediastinum in front of the oesophagus (Fig. 2). It was therefore a para-oesophageal hiatus hernia, according to Akerlund's (1926) classification.

DISCUSSION

"Gurgling at the left base" has been mentioned in several accounts of the disease; but it is not diagnostic, as it is heard in many other conditions and in normal subjects by transmission of the sounds from the abdomen. Unless the gurgling sound is heard in the left side of the chest, is synchronous with respiration, and stops when the breath is held it is not diagnostic. The mechanism by which this sign is produced is simple. During inspiration the intra-abdominal pressure is increased. At the same time the pressure in the thorax becomes more negative. As a result gastric contents, both fluid and gaseous, are forced into the herniated portion of the stomach, so producing the gurgling sound. If in the upright position the fluid level in the stomach is below the opening into the herniated pouch, only gas will pass to and fro and so the sign will disappear, returning when the patient lies down again. I have not encountered this sign in any other disease.

Addendum.—A further case of diaphragmatic hernia in which this sign was present has since been encountered. This was also a hiatus hernia, but of the gastro-oesophageal type, the lower end of the oesophagus being pushed up through the hiatus as well as the fundus of the stomach. The sounds were best heard over the praecordium, the patient lying on her left side.

I wish to thank Dr. Allen Daley, Medical Officer of Health to the London County Council, for permission to publish this paper; and Dr. F. J. Power, medical superintendent of St. Nicholas Hospital, for facilities granted.

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REFERENCES

Akerlund, A. (1926). *Acta radiol.*, **6**, 3.
Harrington, S. W. (1938). *J. thorac. Surg.*, **8**, 127.

Reviews

SURGERY OF REPAIR

The Surgery of Repair: Injuries and Burns. By Squadron Leader D. N. Matthews, R.A.F.V.R., M.D., M.Ch., F.R.C.S. (Pp. 386; illustrated. 45s.) Oxford: Blackwell Scientific Publications Ltd. 1943.

It is a little difficult to know for whom this book is written. The student will find it an interesting and readable account of surgery of repair. The general surgeon will probably be interested in Part I and Part IV and leave the middle portion to the specialist, who in his turn will find this section somewhat inadequate.

Part I deals with the immediate treatment of injuries, and attempts to cover all the ground that has been written on so fully in the last few years. It discusses shock, crush injury, chemotherapy, anaesthesia, the surgery of wounds, nerve and tendon suture, abdominal and chest injuries. Shock is defined in two lines. Would that it were so simple! There is a noticeable tendency to make terse, dogmatic statements on debatable issues. A chapter on fractures of the mandible and fracture of the facial bones is valuable, but this could well be expanded. Part II describes late repair, including scar excision and the many varieties of skin transplantation. These are handled quite well, but without sufficient emphasis on the difficulties that lie in the path of the beginner. Nerve and tendon injuries get another chapter, but there is no warning of tourniquet paralysis, of the bad results of cut flexors, the weakness of catgut, the disappointments of amnioplastin, the unreliability of the reaction of degeneration, or Tinel's sign. Part III is devoted to the repair of facial injuries. Operations are described for dealing with the nose, the lips, the eye, the cheek, etc. Each could do with a book to itself. Such have, indeed, been written. It is quite impossible to cover the field in a book of this size, and the reader should be warned that the repertoire is limited. Part IV is an adequate summary of the treatment of burns, but once again the field of late repair is inadequately covered.

The whole book gives one the impression of being too facile and unfinished. It is a pity that the author takes liberties with proper names, with anatomical nomenclature, and with the English language by using such words as "inrolling" and "pedicled" as verbs.

BORDERLANDS OF PSYCHIATRY

Borderlands of Psychiatry. By Prof. Stanley Cobb. Harvard University Monograph in Medicine and Public Health, No. 4. (Pp. 166; illustrated. $2.50.) Massachusetts: Harvard University Press. 1943.

This is a very readable exposition, consisting of a series of lectures on the body-mind relationship, and especially the brain-mind relationship, in its bearing on disease. The chapter headings—Body and Mind; Parallel Evolution of Speech, Vision, and Intellect; Speech and Language Defects; The Function of the Frontal Areas of the Human Brain; Anatomical Basis of the Emotions; Consciousness; Concerning Fits; Psychoneurosis; Psychosomatics—indicate its scope. The author's general point of view is embodied in the following sentences: "My personal belief is that consciousness . . . is a function of nervous tissue in action, just as contraction is a function of muscle." "My guess just now is that consciousness will sooner or later be described in terms of electronic activity." His approach is therefore essentially neurophysiological, but his presentation is tolerant and well balanced.

Stanley Cobb's explanation of the *modus operandi* of leucotomy is that it depends essentially on cutting out the long-circuiting process which is made possible by the cortex, and that the extent of its effects depends on the number of fibres destroyed.

A PRIMER ON FOOD FOR AFRICA

Food. A Primer for Use in Schools, Colleges, Welfare Centres, etc., in Africa. By Sir Robert McCarrison, M.D., F.R.C.P., and Desmond Fitzgerald Moore, M.R.C.S. (Pp. 116. 2s. 6d.) London: Macmillan and Co. 1943.

The children of Africa to whom this book is dedicated may understand much of what is written in it without supplementary explanation from their teachers, but it will be slow going and dull without discussions and experiments, for it is concisely written and every sentence is a bald statement of fact. Different "lessons" deal with the various components of food—namely, proteins, fats, carbohydrates, minerals, and each of the vitamins A, B (complex), B_1, B_2, P-P, C, and D; with the teeth and gastro-intestinal tract; with the amount of food needed; and with the more common foods, such as cereal grains, tubers and roots, green leaf vegetables, fruits, and vegetable oils, pulses, milk, meat, fish, liver, kidney, egg; and with faults in African diets. The table of food values at the end gives the protein, fat, and carbohydrate content in grammes per ounce, calorie value, and approximate vitamin value—as 0, V.L. (very little), one, two, or three pluses—of the common foodstuffs of Africa. The book is well printed and bound in soft green linen.

Notes on Books

Dr. L. J. HALPERN of Illinois has written a small volume entitled *How to Raise a Healthy Baby* (Hutchinson's Scientific and Technical Publications; 8s. 6d.) which is intended for parents. It is composed on the question and answer principle, and the information contained seems sound except for a dangerous-looking illustration of a baby having its ears and nose cleaned the *wrong* way. Practitioners may like to recommend it to their patients after looking at it for themselves.

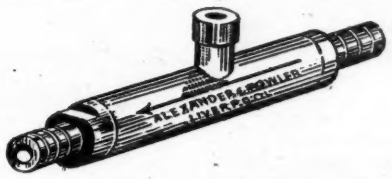
The immediate care that can be given to injured persons at the site of a disaster and methods of transporting them to safety and medical attention are described in a new manual, *Emergency Care of Injured*, issued by the Medical Division, Office of Civilian Defense, Washington. The work is based on procedures and organization developed by the O.C.D. and careful study of three years of British and other air-raid experience. The 117-page book is divided into three parts: "Civilian Defense," "Emergency Field Care," and "Transportation of the Injured."

Preparations and Appliances

A THORACIC ASPIRATING DEVICE

Dr. CLIFFORD RILEY, resident medical officer, Birkenhead Municipal Hospital, writes:

Aspiration of pleural effusion is a surgical procedure which the practising physician frequently has to employ. Various ingenious devices have been evolved to perform this function, they being often either laborious to use or expensive and complicated and "requiring a wheelbarrow" for transport. The device shown in the accompanying illustration has been designed to overcome many of these disadvantages; it consists of two non-return ball valves mounted in a brass casting, with



a side tube to take a standard 20-c.cm. Record syringe. A rubber tube leads from the suction side to the needle in the chest wall, another leads from the delivery side to a receiver. In use, the handle of the syringe is simply pulled in and out. The whole apparatus will fit into an ordinary 20-c.cm. syringe box and can be boiled.

Since its construction four months ago the device has been in constant use in the Birkenhead Municipal Hospital and has never failed to function satisfactorily. It aspirates thick pus of the nature of pneumococcal empyemata with ease, and has been found in practice to empty a pleural cavity in about a quarter of the time required by our "Potain" aspirator.

I wish to thank Mr. Grant for his note of appreciation of this device and for his interest in its development, and also Messrs. Alexander and Fowler, of Pembroke Place, Liverpool, who are producing it, who assisted with its development, and who supplied the illustration.

Mr. R. A. GRANT, M.B., F.R.C.S.Ed., medical superintendent of the hospital, writes:

The above ingenious device, invented by Dr. Riley, is in my opinion a considerable advance over any other appliance used for evacuating fluid from the pleural cavity. I have been impressed with the speed and ease with which pleural fluids can be drawn off. It is small, compact, and would be of equal benefit to general practitioners as to hospital medical officers. There is no complicated mechanism to go wrong, and it can be used in conjunction with any Record fitting syringe.

Nova et Vetera

HARVEY'S TEACHER AS EMBRYOLOGIST

The Embryological Treatises of Hieronymus Fabricius of Aquapendente. The Formation of the Egg and of the Chick (De Formatione Ovi et Pulli). The Formed Fetus (De Formato Foetu). A Facsimile Edition, with an Introduction, a Translation, and a Commentary by Howard B. Adelmann. (Pp. 833. $12.00 or 72s.) New York: Cornell University Press; London: Oxford University Press.

Fabricius of Aquapendente (1533–1619) is known to many as the teacher of Harvey at Padua. His investigations of the veins and of their valves undoubtedly put Harvey on the line of his great discovery. Fabricius has, however, many other claims to remembrance. He was equally accomplished in the practical arts of medicine and of surgery, and he produced the first attempt at a physiology of the special senses as well as several investigations of the organs and functions of speech, of respiration, and of movement. Scientifically his greatest achievements were undoubtedly his treatise, *On the Valves of the Veins* (1603) and his two surviving embryological monographs. Prof. Adelmann here presents us with the embryological works. He has accomplished his task in this beautiful volume in a way that is beyond criticism. Could all scientific classics be thus set forth, the study of the history of science would pass to a new phase.

Fabricius had intended to issue and had substantially completed a comprehensive treatise on embryology. The first part was devoted to the organs of generation and their mode of action. It has been lost. The second part treats of what Fabricius regards as the process of formation of the embryo, and was in effect a painstaking study of the development of the hen's egg. It was issued in 1621, two years after his death, and has certain obvious hiatuses. The third part, the only one that he himself saw through the press, is *On the Formed Foetus*. It appeared in 1604 and contains comparative accounts of the later embryos of a number of species, including man. Prof. Adelmann reproduces both these treatises in facsimile together with a full translation into English. To these he has attached many illuminating notes, a well-conceived biography of Fabricius, and a general history of embryology to the seventeenth century. He has added a painstaking bibliography and a very detailed index. The whole comprises a most attractive book of over 900 pages.

Fabricius the Man

Prof. Adelmann is certainly no hero-worshipper. Fabricius appears here as an entirely human and credible figure: a rather crotchety professor, intellectually active but physically indolent; more interested in research than in lecturing; peppery and at times indiscreet, but certainly not vindictive; over-optimistic as to his own powers and sometimes a trifle contemptuous of those of others. He was rather absent-minded and inclined to take his duty to his university more lightly than his duty to science, but, nevertheless, he was responsible for the building of the famous anatomical theatre at Padua, and, it is said, at his own expense. He was an excellent teacher, but only for those who wished to learn, which is but to say that most students would call him a very bad teacher! Only when he could bring himself to the effort did his class-teaching reach a high standard, and his best efforts were given to his private courses. Among his pupils were most of the distinguished anatomists of the age—such as Salomon Alberti, Caspar Bartholin, Caspar Bauhin, Giulio Casserio, William Harvey, Pieter Pauw, Adriaan van der Spiegel, and Olaf Worm.

A Conservative Philosophy

The positive achievement of Fabricius in the works here edited is very great, and it is almost an excess of the scholar's caution in Prof. Adelmann that he does not reckon it as highly as have some of his predecessors. Fabricius was, after Aristotle, the founder of embryology as a rational discipline and as an observational science. But it is unfortunate that so fine an observer should have been perversely conservative in his theoretical views, and it is yet more unfortunate that he should have infected his pupil Harvey with similar qualities. Reading these works of Fabricius by the side of Harvey *On Generation* one cannot feel that the Englishman has advanced greatly on his teacher, and in certain respects he has even receded. The Achilles heel of Harvey, the superb experimenter, was his obstinately conservative philosophy. Men of science have sometimes thought more about philosophy than is good for their special study. The intellectual lustre of both Fabricius and Harvey is a trifle dimmed, as against certain of the men of their age—as, for example, Vesalius, Stevin, Galileo, and Kepler—by their nostalgia for antiquity. How much more Harvey and Fabricius might have achieved had they known no more of Aristotle and Galen than did Leonardo! What a revolution it was when the Royal Society, a generation later, cut the cable that tied men to the ancient world with the new slogan *Nullius in verba*—"By the words of no man"! Fabricius and Harvey were very great men, but, as Prof. Adelmann shows, they must rank just a little below those who had shaken themselves free from the whole tradition of antiquity. Harvey's inspired vision was neither sustained nor repeated. Fabricius, first-class observer though he was, never had the vision. We believe that in saying this we are not misinterpreting the thought of Prof. Adelmann.

A SIXTEENTH-CENTURY SICILIAN PHYSICIAN

The recent prominence in the war news of Sicily and especially of the town of Ragalbuto brings to mind that this town was probably the birthplace of Giovanne Philippo Ingrassias, who was born in 1510. He studied medicine at Padua, graduating from there in 1537. He soon became well known in Italian medical circles and was called to the chair of medicine at Naples. It was at Naples, in 1553, that he published a book entitled *De Tumoribus praeter Naturam*, in which he gave what is the first authentic account of scarlet fever. This disease was known among the countryfolk as "rossalia" or "rosania," and is described by Ingrassias as consisting of "numerous spots, large and small, fiery and red, of universal distribution, so that the whole body seems as if on fire." Scarlet fever was at this time confused by others with measles, but Ingrassias differentiated the two maladies thus: "Some there are who think that measles is the same as rossalia, but we have often seen with our own eyes, that they are different, not trusting to the description of others." He also gave a short description of chicken-pox in the same treatise. His account of this ailment occurs during his discussion on measles and rossalia: ". . . the other, *crystallos*, which since, as is known, reddish pustules break out and are dispersed over the whole body, the size of a pea, more or less, white and of a shiny crystal appearance which when they are opened one sees an aqueous fluid escape."

Ingrassias returned to Sicily and took up his abode in Palermo in 1560. In this city he became so celebrated that he was called the Hippocrates of Sicily. So great was his fame that he was appointed physician-in-chief to Sicily and the neighbouring islands by King Philip II of Spain in 1563. Ingrassias taught not only medicine but also anatomy, and anatomists associate his name with the lesser wings of the sphenoid bone, and he is accepted as being the first to describe the stapes of the middle ear. During his residence in Palermo, Sicily was ravaged by a severe epidemic of plague, and Ingrassias rendered great service during this crisis. He was offered a pension as a reward for his services, but this he declined—an action so unusual that it is recorded in accounts of his life. He was a prolific writer on many medical topics, both clinical and educational. He died in 1580.

H. P. TAIT.

The *Journal of the American Medical Association* announces that a permanent memorial to William Beaumont (1785–1853), known as the founder of modern knowledge of the physiology of the stomach, has been assured by the transfer of the historic "Early House" on Mackinac Island to public ownership. In this house the young Canadian half-breed Alexis St. Martin, who was the subject of Beaumont's famous studies, received his accidental shot-gun wound on June 6, 1822, which caused a permanent gastric fistula. In the work of restoring the house technical advice will be given by a committee of the Michigan State Medical Society, the National Park Survey, and other agencies and historical sources.

W. Wespi (*Schweiz. med. Wschr.*, 1943, **73**, 1257), who records an illustrative case, states that six cases have hitherto been reported of damage to the peripheral and central nervous system following "sedormid" (allylisopropylacetyl-carbamide). Wespi's case was that of a woman aged 21 who developed toxic polyneuritis after suicidal ingestion of 30 tablets. Recovery took place after several months' illness.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY JANUARY 15 1944

EDUCATION BILL: THE SCHOOL MEDICAL SERVICE

The care of the health and physical welfare of school-children became a function of local education authorities when the Education (Administrative Provisions) Act was passed in 1907. It was extended by the Education Act, 1921. The scope of the authorities' duties and powers has been laid down from time to time by Regulations of the Board of Education, and includes obligatory medical inspection of both elementary and higher school children, and arrangements for attending to the health and physical condition of children, which are obligatory in the case of elementary but optional in higher schools. These latter arrangements have been defined by regulation as including the following-up of cases of defect found at inspection, the detection and prevention of uncleanliness, and the medical treatment of defects of the eyes and teeth, minor ailments, and enlarged tonsils and adenoids. In fact most authorities, and virtually all the larger ones, have adopted schemes, with the approval of the Board, which provide for a further extensive range of treatment—for instance, of cripples, children suffering from diseases of the special senses like otorrhoea, from speech defects, and from incipient psycho-neuroses. Some orthopaedic hospitals are largely maintained by payments or contributions from local authorities, exercising their dual responsibility for children of both pre-school and school ages. The only specific limitation of the powers of these authorities, as defined by law, is an embargo on their establishing a general domiciliary service of treatment by medical practitioners.

It is difficult to assess in precise terms the benefits derived from the school medical service, but there can be no doubt that it has played a large part in the improvement in the health, physical well-being, and cleanliness of children as compared with thirty years ago. Its work has been as much educational as diagnostic or therapeutic or directly preventive. The excessive claims on its behalf which are sometimes made by lay persons do not originate from school medical officers themselves, but it is significant that teachers—to whom this service brought work, trouble, and disturbance of routine, and who are in a good position to observe results—are among the strongest advocates of its continuance and expansion. For medical officers keenly interested in minor departures from anatomical, physiological, nutritional, and psychological averages it has proved an engrossing field of work, and indeed it has been almost the only wide field for the constant promotion of health in the positive sense. Many, however, have latterly been chafing at the dull routine of much of the work. It is at least evident that attention to some of the minor ailments they deal with would not have fallen to clinics instead of the family doctor but for the fact that this attention was obtained free or at little cost.

The Education Bill does not set out to change the school medical service but rather to extend its application, although there is a hint, which has been made a little more explicit by a recent statement of Mr. Butler's in Parliament, that such change may come with the establishment of a comprehensive medical service for the nation. There are points of wording in the relevant clauses that deserve careful attention. For instance, the phrase "attending to the health and physical condition" in the Act of 1921 is eliminated and replaced by a blunt reference to medical treatment, which is defined as "treatment by any duly qualified medical practitioner or any person registered under the Dentists Act, 1878." In its context this clearly includes, for the present, treatment by school medical officers and school dentists, and it is evident that school medical inspection and other medical duties are to be carried out by officers employed or engaged by the education authorities. Nevertheless, the duty of an authority is stated in broad terms—viz., "to make such arrangements for securing the provision of free medical treatment for pupils in attendance at any school or young people's college maintained by them as are necessary for securing that comprehensive facilities for free medical treatment are available to them under this Act or otherwise." This seems to make it possible for the treatment of school-children to become, as it ought to be, part of a comprehensive medical service for the people, and not a direct function of education authorities. But medical inspection of all school and college children remains definitely a duty of the authorities. It may not be practicable to perform this duty without employing medical officers specially for the purpose—a position which will raise questions as to the desirability of relegating large numbers of young medical men and women to work entirely divorced from the clinical activities which maintain their interest in medicine. This is a difficulty which must be faced in planning the details of any future service of a general kind.

Treatment does not include treatment at the pupil's home; but otherwise, it will be observed, is to be entirely free of charge. These clauses apply as from April 1, 1945. Unless, and until, a comprehensive medical service for the people is in being, the new provision may cause curious anomalies. The parents of a pupil who is not confined to bed at home will be entitled to demand free treatment for him at either a clinic or a hospital. Indeed, unless the approved "arrangements" specifically prohibit treatment at the surgery of a private practitioner and provide as an alternative adequate facilities for the treatment of ambulatory illness of all kinds among pupils, it seems possible that the parents could ask the authority to foot the family doctor's bill for other than domiciliary treatment. Further, the responsibility would seem to extend to the cost of treatment in voluntary as well as municipal hospitals unless education authorities specifically inform parents that they disapprove of such treatment. Does this mean that education as distinct from health authorities are to enter forthwith into contracts with the managers of these hospitals?

Or, more probably, does it imply that the Government proposes that a comprehensive medical service shall be in operation by April 1, 1945, so that in any case by that time no parent would be called on to pay for the medical treatment of his child? But if this surmise is right, why the exclusion of domiciliary treatment from the free service? The financial memorandum suggests that, however the medical service is provided and administered, the cost will fall on education funds, for it is estimated to involve after seven years an increase in the annual expenditure on education of £6.5 million; but perhaps the inauguration of a general medical service would be accompanied by a transfer of these and existing costs to the appropriate account.

Certain clauses of the Bill mention the school medical officer, but his status is not defined beyond the requirement that he must be a duly qualified medical practitioner. The Minister has power to make regulations which may prescribe that certain examinations shall be carried out by an officer with special qualifications and specially selected for the purpose with the Minister's approval. It may be noted that, whereas the financial regulations relating to the school medical service are the responsibility of the Minister of Health—though this function may be given to the Minister of Education by "arrangement" as at present—the latter is given the regulating power as to the special qualifications mentioned above. The need for abolishing the power of local authorities to subordinate the medical officer to another non-medical official is not met in this Bill; it is an administrative question which the British Medical Association has frequently raised but which may perhaps lend itself more appropriately to regulation.

The administrative provisions contained in the Bill may indicate how the Government's mind is running in other spheres. The President of the Board of Education becomes the Minister of Education, with all the adjuncts of a Ministry. Advisory councils are to be set up separately for England and Wales, the members being appointed by the Minister on the basis of their experience in education. Locally the authorities are the county and county borough councils; but the former may, if they care and if the Minister sanctions, delegate all or any of their executive functions to "divisional executives," although they must remain themselves responsible for borrowing money and raising a rate. Although a county and county borough education committee, to which educational matters shall stand referred, must be established, and must include persons of experience in education so long as the majority of the members are councillors, there is nothing in the Bill to ensure that the divisional executives will contain knowledgeable persons except the Minister's power to modify a scheme. The Minister may also by order constitute a joint education board of two or more major authorities, consisting entirely of members of these authorities, but under the same obligations as to the establishment and constitution of an education committee. It seems unlikely that this piecemeal system of combination on the one hand and delegation on the other for special purposes will go far to meet the clamant need for a general reform of local government.

MALARIA AMONG TROOPS IN WEST AFRICA

Few countries have a worse reputation for unhealthiness than West Africa, and by "unhealthiness" in the Tropics is always meant malaria. Now that troops in numbers as never before are stationed or operating in some of the most malarious countries in the world, it is very important to know what clinical types of malaria are characteristic of such regions. This is so not only that medical officers having to treat cases of malaria perhaps for the first time should know what kind of cases to expect and look out for, but also to give guidance in treatment, convalescence, invaliding, and other arrangements for the medical care of troops. We might also reasonably expect to gain some clue to the effectiveness of suppressive drug prophylaxis and the adequacy of preventive measures as brought to bear in such areas. Further, it is important to know the relative frequency of the different clinical types, and above all what is the most usual class of case being admitted to hospital under such conditions.

It is information of this kind relating to a particular locality in West Africa that has been most adequately given in a paper published in this issue of the *Journal* by Capt. S. B. Hughes and Lieut.-Col. R. R. Bomford. These authors make an analysis of cases seen by them among British troops in two military hospitals in West Africa during 1941 and 1942. The analysis deals with 846 unselected cases. Of these 818 fall within five recognizable types. Of the remainder, 24 were particularly mild cases in which the patients had no fever and complained only of quite minor symptoms, and 4 were cases having jaundice as the principal feature. It should perhaps be noted here that infections other than those of malignant tertian malaria were rare and usually contracted outside the area. Of the 818 typed cases no fewer than 684 were of the "febrile type" (Type I). These cases, judging by the symptoms described, were what might be called ordinary attacks of malaria such as are common enough among civilian residents and which, as an occasional illness, and apart from frequent repetition, are neither in themselves very serious nor permanently incapacitating to the individual. Vomiting was one of the most distressing concomitants, but was present in only about one-third of the cases. The hot stage lasted from 10 to 36 hours—a very usual period for malignant tertian—and was characterized by the usual high temperature, discomfort, and in some cases prostration. Of the second type, the gastro-intestinal, 11 had vomiting as the chief symptom, 24 were diarrhoeic, and 12 had blood and mucus in the stools. There were 39 of the respiratory type (largely bronchitis), and 10 of the myalgic type with muscular pain and stiffness; 2 only had cerebral symptoms, both cases completely recovering. In less than 10% of all the cases, the authors say, could the patient be described as severely ill, and in less than 1% as dangerously ill. Only 4 developed blackwater fever, of whom 2 died. All the cases were in males aged 18 to 51, who for the most part were in a malarious area for the first time. All were under the observance of antimalarial precautions and the taking of suppressive drug, so far as this could be ensured by disciplinary measures.

It must be admitted that the picture is startlingly different from that gained from descriptions of clinical types of malaria in West Africa as given in many of the older accounts. It is even surprising from the modern standpoint. The conditions in West Africa, so far at least as the coastal belt is concerned and for some hundreds of miles inland, are those now commonly described as hyperendemic—i.e., applying the term strictly, the indigenous population is in a state of almost universal infection, indigenous adults, by reason of immunity acquired in childhood, being largely free from active manifestations of the disease. In such areas European and other immigrant stranger communities, however, suffer very severely not only from malaria but from blackwater fever the result of such malaria. It is not often that European troops on any scale have been exposed to these conditions, though we have a few examples such as the Ashanti Expedition, which, though (like most tropical campaigns) of only some months' duration, was nevertheless a classical example of what malaria can be in such circumstances. That blackwater fever cases in the present instance were so few is to some extent understandable, since this condition rarely develops until after some considerable period of residence, and its occurrence might be expected to be lessened where proper hospital treatment replaced the self-treatment as usually practised by the civilian resident community in such areas. But even so the incidence is less than one might have expected, while the virtual absence of cerebral and other pernicious forms is very noticeable. The authors do not state in what part of West Africa their observations were carried out. But assuming that it was in the malarious coastal zone it is relevant to note that the troops concerned were not only under suppressive treatment during their stay in the country but were subject to other preventive measures. It is not, therefore, beyond the bounds of probability that these measures were responsible for the relatively mild type of infections encountered. It might be asked, then, why our troops should have suffered so severely in the last war in countries where malaria was essentially not more heavily endemic than in West Africa and where protective action was also taken. The answer, we hold, is that it is only in this war that the command and the troops themselves have become really "malaria-conscious," and as a result the measures adopted have been far more thoroughly thought out, carried out, and enforced; and it is not so surprising to believe that they have been correspondingly effective.

REINTEGRATION AT LINCOLN'S INN FIELDS

The Council of the Faculty of Radiologists has decided that on March 25 the headquarters of the Faculty will be moved to 45, Lincoln's Inn Fields, premises belonging to the Royal College of Surgeons of England. Several clinical associations will make their headquarters in the same building, and a joint secretariat will be established. The associations which have decided to take part in this development are the Association of Surgeons, the British Orthopaedic Association, the Association of Anaesthetists, the British Association of Oto-Laryngologists, and the Council of British Ophthalmologists. The *British Journal of Surgery* also will have an office in the building. Meetings of committees will be held in the associations' own rooms; councils and general meetings will take place in the Royal College of Surgeons, next door but one to the new offices. The Royal College of Surgeons welcomes this plan, which is designed to establish closer union between specialist departments and general medicine and surgery, and the College will give every possible assistance to ensure the success of the undertaking.

MORE LIGHT ON THE B COMPLEX

In 1940 Van Etten and others[1] found that the administration of an ample supply of crystalline vitamin B_1 did not prevent convulsions and nerve degeneration in swine fed on autoclaved liver and whey. The experiments of Wintrobe[2] carry the matter a stage further, with an accurate description of symptomatology and pathology in pigs receiving all the known members of the B complex except B_1. The earliest clinical manifestations were failure of appetite and vomiting, followed by cyanosis, dyspnoea, and bradycardia, and ending with a severe degree of heart failure or sudden death. No abnormality of neuromuscular disturbance, such as ataxic gait, was ever observed. Careful histological examination of the nerve tissues, central and peripheral, gave no evidence of degeneration or inflammation, but in practically every case local necroses of the myocardial fibres were present in both auricles and ventricles. Where the pathological condition had not advanced too far, administration of B_1 led to recovery. Of particular interest are the biochemical findings. The concentration of carbonyl compounds estimated as pyruvic acid was proportional to the degree of severity of the deficiency as judged by the clinical manifestations. A sharp rise in blood pyruvic acid was quickly followed by the rapid progress of the disease. It was also found that a significant increase in blood pyruvic acid after the administration of glucose always occurred in B_1-deficient animals but not in the control group. As for urinary content of B_1, it reflected—but by no means consistently—the dietary intake immediately before the collection of urine. Of more value in assessing the degree of B_1 deficiency was the percentage retention of B_1 after a given dose. This test, suggested by Najjar and Holt,[3] gave results which ran parallel with the clinical findings and the amounts of B_1 in the diet.

It is clear from this work that the position of vitamin B_1 as the antineuritic vitamin has been strongly assailed, supporting the sceptical view put forward by Meiklejohn[4] in 1940. He concluded his review with the statement that probably a multiple deficiency is responsible for nutritional neuritis but that there is still a possibility that the true antineuritic vitamin has yet to be discovered. By the use of crystalline vitamins Wintrobe and his colleagues have shown that neither riboflavin nor nicotinic acid has any effect in maintaining the integrity of nervous tissue.[5] It was then found that the ataxic gait and the degenerative nerve lesions brought about by a dietary deficiency of the vitamin-B complex are completely prevented by whole desiccated liver.[6] The anti-pernicious-anaemia fraction was found to be the most potent of the individual liver fractions, none of which are as efficacious as whole liver, even when given parenterally, and the results suggest that there is a need for passage of the nerve-protection factor through the gastro-intestinal tract. Finally it has been

1 *J. Nutrit.*, 1940, **20**, 607.
2 *Johns Hopk. Hosp. Bull.*, 1942, **71**, 141.
3 Ibid., 1940, **67**, 107.
4 *New Engl. J. Med.*, 1940, **223**, 265.
5 *Johns Hopk. Hosp. Bull.*, 1940, **67**, 377.
6 *J. clin. Invest.*, 1942, **21**, 71.

shown[7] that the dietary deficiency of either pyridoxine or pantothenic acid leads to an ataxic gait in swine and degeneration of sensory neurons which could invariably be prevented by the administration of these substances. The claim of one of these constituents of the vitamin-B complex is considerably strengthened by the finding that the protective actions of the various liver fractions is proportional to their contents of pantothenic acid.

OESOPHAGEAL STRICTURE: A REMARKABLE CASE

It is not often that one finds excellent narrative, sustained interest, and valuable information in a medical article, but all these are in an account by Prof. Grey Turner[8] of the treatment of a case of fibrous stricture of the oesophagus in which normal swallowing was quickly restored by simple bouginage. For 19 years the patient had taken all his food by gastrostomy and had abandoned hope of any relief. The patient was a young medical man 26 years old, and himself contributes the case history, which is a model of what a case history should be. The stricture had followed the swallowing of caustic soda at the age of 7, and gastrostomy became necessary soon after. A year later he was taken to Copenhagen, where Prof. Rovsing found what was thought to be complete obliteration of the lumen of the oesophagus and attempted to perform an anterior oesophagoplasty by means of a skin tube. This failed completely, and after a stay of 18 months the patient returned home with a cervical fistula and a gastrostomy, which were eventually connected by a rubber tube through which he took all liquids and solids without disability for many years.

Eventually, while a medical student, the patient began to have severe pain of ulcer type which proved so disabling that he consulted Prof. Grey Turner. Radiographic examination revealed a long stricture in the oesophagus which was said to be absolute, but owing to Grey Turner's experience of similar unpromising cases in which treatment by bougies had proved successful[9] a further attempt at this was advised. The patient was enthusiastically co-operative, and there is no doubt that a great deal of the ultimate success was due to his intelligence, perseverance, and courage. After great difficulty a No. 6 oesophageal bougie engaged in the stricture and eventually was made to pass it; a week later the next larger size could be used. This simple statement hides much dogged endeavour on the part of the patient, who would spend an hour or more, often suffering much physical revulsion, before the passage could be achieved. Grey Turner emphasizes that it is not a question of "passing" or "forcing" the bougie through the stricture, for at no time could this be done by intent. The patient was merely assisted or himself assisted in the *swallowing* of the bougie. Rapid forcible dilatation of a stricture at intervals, especially under anaesthesia, is not good practice and leads to further damage by tearing scar tissue, which is then followed by more fibrosis and more contracture. The essence of treatment should be the gentle, daily, self-dilatation; the co-operation of the patient is imperative, and in a difficult case not even the greatest skill on the part of the surgeon can replace its absence.

It was soon possible to give some solid food, itself a great additional help, since each bolus acts as a dilator. From this time on progress was rapid—of course aided by the passage of increasing sizes of bougies—so that the patient was able to take all his food by mouth and was discharged from hospital exactly 60 days after admission. He had entered being unable to swallow even saliva by the natural route, with disabling gastric pain from long wearing of the gastrostomy tube, and without apparent hope of relief from his stricture; and yet he left hospital after this relatively short time able to eat and swallow almost like a normal individual. Apart from minor setbacks his progress was maintained during the rest of his medical studies and even during the arduous duties of a house officer during heavy air raids. Eventually it became possible to close his gastrostomy and later still his cervical oesophagostomy. This was done over a year ago, since when he has served as house-surgeon to Prof. Grey Turner, working hard and successfully with no difficulty in swallowing.

The story of this simple but dramatically successful treatment for what had been thought to be an incurable condition makes most encouraging reading. Grey Turner emphasizes that even in a case with apparent complete fibrous obstruction a narrow, tortuous, but mucous-lined track may exist and may well be exploited to achieve success. It is especially important to bear this in mind in view of the recent accounts of routine anterior oesophagoplasty with jejunal tubes being performed for simple stricture of the gullet.

OPERATION FOR PATENT DUCTUS

The surgical treatment of congenital patency of the ductus arteriosus has been to the fore in recent years. Examining the records of 57 adults who had had simple patency of the ductus arteriosus and had died, Keys and Shapiro[1] found the cause of death to be subacute bacterial endocarditis in over 40%; 28% died of congestion failure, and 3.3% from rupture of a pulmonary aneurysm. After the age of 17 years patency of the ductus arteriosus was associated with an average expectation of life of about 25 years, or about half that of the general population. These authors concluded that an attempt at ligation is justified in spite of the absence of signs of decreasing adjustment to the defect.

The surgical treatment of the infected ductus is, however, well established. Touroff[2] has operated on 12 cases: seven patients recovered, two died as the result of the operation, and three died of their disease in spite of surgical intervention. Tubbs[3] in this country operated on nine cases: five patients are well after 18 months (the longest after 3½ years), one after 4 months. One patient died from the operation, and the seventh patient, though alive when the paper was written, still had bacteriaemia and was reckoned a failure. The combined figures give success in 13 cases out of 21 operated on, with 3 operation deaths. Touroff considers peripheral embolism a contraindication to operation when the vegetations have spread from the infected ductus to the mitral and aortic valves. Two of his cases with signs of peripheral embolism were unaffected by operation and continued to have bacteriaemia after it. Spread of the infection to the aortic end of the ductus without signs of aortic valve disease will not respond satisfactorily, but it may be difficult to diagnose the condition unless peripheral embolism occurs. It is less certain what the result will be where there is spread of infection on to the pulmonary valve. Cardiac failure, however, and poor general physical condition are not considered to contraindicate operation. One case with pulmonary infarction recovered.

The operation usually consists of ligature of the ductus, though in two cases Touroff divided it. Many of the cases had preliminary chemotherapy without effect, and though it is probable that a short course of drug treatment is advisable, operation must not be too long delayed.

7 *J. Nutrit.*, 1942, **24**, 345.
8 *Brit. J. Surg.*, 1943, **30**, 344.
9 Ibid., 1939, **26**, 555.

1 *Amer. Heart J.*, 1943, **25**, 158.
2 Ibid., p. 187.
3 Hunterian Lecture, R.C.S., April, 1943.

THE LATE G. C. ANDERSON

SERVICE OF REMEMBRANCE

A memorial service for Dr. Anderson was held on the day of the funeral, Wednesday, Jan. 5, in St. Pancras Parish Church, which is close to the house of the British Medical Association. The large church was filled with personal friends and colleagues and representatives of Government Departments, medical bodies, and the many organizations with which the late Secretary in one capacity or another had been actively associated. Such an assembly, many of those present bearing names eminent in medicine and in public affairs, was an indication more significant than many words could have been of the esteem in which he was held and the impress of his personality and work. The principal Officers of the Association and members of Council living in or near London attended, and many members of the Association came from distant Divisions. All grades of the staff at headquarters, from whose building the flag was flying at half-mast, were present. The service preceded the funeral, which was private and took place at Golders Green Crematorium later in the day.

The Vicar of St. Pancras (the Rev. Frank Jones), whose helpfulness in facilitating the arrangements at short notice was greatly appreciated by the Association officials, conducted the service. He was assisted by Mr. Maurice Vinden at the organ. The choir of St. Mark's, North Audley Street, attended, and their lead in the singing of the hymns, "For all the saints," "O love that will not let me go," "The King of Love my Shepherd is," Blake's "Jerusalem," and the twenty-third Psalm, added greatly to the beauty of the service.

Lord Dawson's Tribute

Dr. H. Guy Dain, Chairman of Council, read the lesson from Ecclesiasticus ("Let us now praise famous men"), and Viscount Dawson of Penn, the President of the Association, ascended the pulpit and paid a short but feeling tribute. "Gathered together at this service of remembrance for George Anderson," he said, "we sorrow for his death, but equally express our thankfulness and admiration for his life." He proceeded to sketch the salient facts of Dr. Anderson's career, pointing out what a background of varied experience in medical practice he had had before beginning his administrative office as Deputy Medical Secretary in 1919.

"His eleven years as Secretary of this great and expanding Association (its numbers nearly doubled during his term of office)," Lord Dawson continued, "coincided with the rising tide of new knowledge, with earnest endeavour to bring within the reach of all citizens services for the furtherance of health and the cure of disease, and widening interest in the health and welfare of the people. Then, as the darkness of war drew near, came his organization of recruitment of the whole profession for war conditions, and when war did come the bringing into action of that vast machinery of which he has been the moving spirit and ever-constant guardian. We may add to this his idea—for it was his—of the Medical Planning Commission, which resulted in a considerable consensus of opinion within the profession in the matter of medical reconstruction, now so imminent for public discussion.

"In the earlier years of his Secretaryship he showed his powers of organization in other fields by the visits of the Association over-seas—I may instance the World Tour and the memorable meeting at Melbourne in 1935. Not only was the organization perfect, but his genius for friendship brought men of different countries together and enhanced the reputation of Great Britain. These are but a few examples of his many activities, which during the war absorbed his laborious days; indeed, the later years of his career were the history of the Association.

"I pass to make reference to the attributes which, combined with his great gifts of organization, made Anderson such an outstanding success as a leader of men. His erect, active body, befitting the athletic prowess of his youth, made him an impressive figure. His charm of manner and his 'forthcomingness' drew men towards him, and his genius for fellowship made the world his parish. Faith and foresight inspired his thought; his power of concentration, his prodigious capacity for work, and his infective enthusiasm got things done.

"In discussion he was receptive, and in speech firm and persuasive, and his gaiety of spirit was seldom far away if proceedings dragged and men were dour. In the course of his work he lit many fires in cold rooms. In conferences and negotiations with Government or other bodies his intimate knowledge of the subject, his judgment, and the complete trust reposed in him made him a strong and welcome representative.

"Anderson's many gifts of mind have been the instruments of his success, but these were not the source of the warmth of regard and affection which he aroused wherever he went and will make his memory long abiding. Underneath all, he loved his neighbour as himself. There was always in his mind a desire to be helpful to his fellows and, forgetting self, to do his all for his day and generation. 'He was a good man and did good things.'

"Here our thoughts turn to the partner of his life and his doings, who encouraged his aspirations and shared his struggles, his triumphs, and his trials. To her our hearts extend affectionate understanding. Those who worked with Anderson will profit by what he has so richly garnered, and still more by his high example. We bid him farewell and shall hold his memory in our hearts."

After the Blessing the Vicar read the concluding passage from the second part of *The Pilgrim's Progress*, the story of how Greatheart passed over, and "all the trumpets sounded for him on the other side." This was followed by Jeremiah Clarke's trumpet voluntary, orchestrated by Purcell, and the triumphant tones of Chopin's "Funeral March" brought the service to a close.

The Congregation in St. Pancras Church

Those present at the service included the following:

Representing the British Medical Association: Lord Dawson (President), Dr. H. Guy Dain (Chairman of Council), Sir Kaye Le Fleming and Mr. H. S. Souttar (Past Chairmen), Dr. J. W. Bone (Treasurer), Dr. O. C. Carter, Mr. Zachary Cope, Dr. F. Gray, Dr. E. A. Gregg, Col. H. A. Proctor, and Dr. S. Wand (members of Council), Sir Farquhar Buzzard (former President), Dr. C. O. Hawthorne (former Chairman of Representative Body), and the following among other representatives of Divisions: Dr. G. E. Orme (Westminster and Holborn), Dr. A. Baldie (Marylebone), Dr. H. S. Pasmore (Kensington), Dr. A. T. Rogers (Bromley), Dr. A. P. Ford (East Herts), Capt. Laurie Smith (Blackpool); also the Officials of the Association, the Solicitor, and many members of the staff at B.M.A. House from all the departments. Severe illness prevented Dr. Alfred Cox from attending.

The Ministry of Health was represented by Sir John Maude (Secretary), Sir Wilson Jameson (Chief Medical Officer), Prof. F. R. Fraser (Director-General, E.M.S.), Sir Weldon Dalrymple-Champneys (Deputy Chief Medical Officer), Dr. F. Murchie, and Mr. A. W. Neville (Principal Assistant Secreary). Other representatives of Government Departments were: Dr. J. Alison Glover (Board of Education), Dr. E. R. A. Merewether and Mr. R. W. Luce (Ministry of Labour and National Service), Dr. A. G. H. Smart (Colonial Office), Dr. A. Sandison (Ministry of Pensions), Mr. R. B. Crabb (Ministry of Fuel and Power). Lieut.-Gen. Sir Alexander Hood, Director-General, represented the Army Medical Services, and Mr. Louis Infield represented Sir Geoffrey Shakespeare and the Medical Personnel (Priority) Committee.

The Royal College of Physicians was represented by Prof. F. S. Langmead and Dr. H. E. A. Boldero (Registrar), and the Royal College of Surgeons by its President (Sir Alfred Webb-Johnson), Surgeon Rear-Admiral Gordon-Taylor, and Sir Hugh Lett. The following bodies were represented by their Presidents: the Royal College of Obstetricians and Gynaecologists (Mr. Eardley Holland) and the Royal Society of Medicine (Sir Henry Tidy), and the Society of Apothecaries by its Master (Sir Stanley Woodwark). Other representatives of medical bodies were Sir Edward Mellanby (Medical Research Council), Dr. A. Hope Gosse (Medical Society of London), Dr. Janet Aitken (Medical Women's Federation), Dr. J. C. Bridge (Association of Industrial Medical Officers), Dr. E. Goodwin Rawlinson (Royal Institute of Public Health and Hygiene), Dr. Alan Moncrieff (British Paediatric Association), Dr. Charles Newman (British Postgraduate Medical School), Major H. Lockwood Stevens (London School of Hygiene and Tropical Medicine).

Others who were present were the Viscountess Dawson of Penn, Lady Moran, Dame Louise McIlroy, Sir Henry Dale, P.R.S., Prof. T. B. Johnston, Mr. W. McAdam Eccles (also representing the British Social Hygiene Council), Mr. James Wyatt, Miss Elizabeth Bolton (London School of Medicine for Women), Sir T. P. Dunhill, Sir Arnold Lawson, Brigadier J. R. Rees, Col. C. B. Heald, Sir Robert Stanton Woods, Prof. J. R. Learmonth, Capt. G. S. Elliston, M.P., Alderman Sir David Davies, Surgeon Rear-Admiral Malone, Dr. H. Crichton-Miller, Dr. Andrew Topping (London County Council), Dr. S. C. Alcock (Reading), Dr. G. Clark Trotter (Hampstead), Mrs. Scott (representing Dr. C. F. T. Scott, Willesden), Dr. Arthur Ricketts, Miss C. Neill (representing Lady Neill), Mr. H. L. Jackson (H. K. Lewis and Co., Ltd.), Dr. Lina Potter, Dr. Margaret Jackson (*Lancet*).

Representatives of various medical and ancillary organizations included Dr. J. B. Mennell (Association of Anaesthetists), Dr. J. R. Whitwell (Royal Medico-Psychological Association), Dr. Harley Williams (National Association for the Prevention of Tuberculosis), Capt. E. J. C. Chapman (British Empire Cancer Campaign), Dr. R. Sutherland (Central Council for Health Education), Dr. Robert Forbes (Medical Defence Union), Dr. C. L. Batteson (London Panel Committee), Dr. L. G. Glover and Mr. E. C. Pennefather (Royal Medical Benevolent Fund), with Lady Woodwark representing the Ladies Guild,

Miss Macfie (Royal College of Nursing), Mr. H. N. Linstead, M.P. (Pharmaceutical Society of Great Britain), Mr. T. Heseltine and Mr. G. A. Mallinson (National Pharmaceutical Union), Mr. Donald Cox and Mr. W. G. Senior (British Dental Association), Mr. Horace H. Rew (Examining Board for England), Prof. Samson Wright and Mrs. Haigh (Central Office for Refugees), Mr. P. W. L. Camps (British Hospitals Association).

Other bodies represented were: London Insurance Committee, National Association of Insurance Committees, National Association of Clerks to Insurance Committees, National Amalgamated Approved Society, Joint Committee of Approved Societies, National Federation of Employees Approved Societies, National Ophthalmic Treatment Board, Guild of British Dispensing Opticians, King Edward's Hospital Fund for London, Hospital Saving Association, British Hospitals Contributory Schemes Association, War Organization of British Red Cross and Order of St. John, Industrial Welfare Society, Clerical, Medical, and General Life Assurance Society, Medical Sickness, Annuity, and Life Assurance Society, Medical Insurance Agency, British Medical Bureau, Public Dental Services Association, Chartered Society of Physiotherapy, and the Magistrates Association. Also represented were the Sandy Lodge Golf Club and the Rotary International.

FURTHER TRIBUTES

The following further appreciations of Dr. Anderson have been received, supplementing those written by Sir Kaye Le Fleming, Mr. H. S. Souttar, and Dr. H. Guy Dain, and published in last week's *Journal*:

Lord MORAN, President of the Royal College of Physicians, writes:

The loss of a man like Anderson, who had worked at the headquarters of the British Medical Association for a quarter of a century, would be felt by the profession at any time; just now it is nearly irreparable. Others are more competent to record what he did for the Association, but I want to say something of the work of the Association for the nation. It planned for war in peace, when foresight was not common. The register of doctors, which Anderson designed, made it possible when war came to preserve a just balance between the demands of the Services and of the home front. For he was a realist. He knew what the average doctor was thinking, what he would accept and what he would not, and this knowledge gave him poise and lent weight to his word in council. He had the independence of his race, and the downright honesty of his speech was the expression of a mind that had not been touched by the blight of routine. He could see, beyond the interests of the members of the Association, what was good for the country as a whole. When he had to say things that were unpalatable, he said them to your face, disarming criticism, so that when I came to propose his election to the Fellowship of the Royal College of Physicians, at a time when the policy of the College and that of the Association were sometimes at variance, it was typical of the man that there was no opposition of any kind to his election.

In his youth there was a time when no Scot could live with him over hurdles, and he kept to the end the easy way with men which often has a beginning in the good fellowship of sport.

Anderson felt the burden that presses on those who have to make decisions on matters of moment for others, but he found comfort always where alone it can be found: in the integrity of his own mind and in the quiet peace of his home.

Prof. R. J. A. BERRY writes:

As a member of Council who has probably known personally the late Dr. G. C. Anderson for a longer period of time than any of my colleagues it seems fitting that I should assume the privilege of a friend to say a few words of farewell.

In those now distant days when the intelligentsia of the period were fond of describing the times in which they lived as *fin de siècle*, and the less intelligent were vehemently arguing whether the year 1900 was the last of the nineteenth century or the first of the twentieth, there walked into my retiring room at the anatomy department of the New School of Medicine of the Royal Colleges of Edinburgh a tall gracefully built youth who expressed his desire of joining the anatomy classes then under my charge. A student of the University of Edinburgh, he gave his name as George Cranston Anderson. From that moment there was born between us a firm personal friendship which only terminated on Jan. 1, 1944. In those days the association between teacher and taught was more close, intimate, and personal than it is to-day, and on the whole I think the loss is the teacher's. With Anderson's graduation, his departure to the kingdom of Fife, and my own parting from the city of our dreams, our ways in life were naturally sundered but never dissolved. Always, on returning from over-seas to London, one of the pleasures was a call upon George. Here was conviction, if indeed conviction were needed, that in him, as revealed by his talk, the Association had secured the aid of a loyal, devoted, and enthusiastic servant. Confronted as he constantly was by a multitude of diverse minds, never once did I hear him speak unkindly of those from whom his duties sometimes compelled him to differ.

Recently at Manchester, and for the last time, I heard Anderson address an enormous congregation of medical men, not all of whom were at one with him. Nevertheless Anderson's tact, his courtesy, his powers of explanation, his mastery of his subject, and an all-pervading good humour, afforded a most convincing proof of his devotion to his colleagues and the best interests of the Association he was so proud to serve. "Evolution, not revolution," and never did Anderson plead more convincingly or with greater effect. "Let us have faith that right makes might; and in that faith let us, to the end, dare to do our duty as we understand it," and George Cranston Anderson did it to the very end.

Lieut.-General Sir JAMES A. HARTIGAN, K.C.B., writes:

Will you allow me to express my very real regret at the death of Dr. Anderson? During the four years I was at the War Office I was in close touch with him, and learned to appreciate his clear and active mind, his powers of administration, and his far-seeing vision. I would say that his main aims in life were to do all in his power to provide the best medical care for the community at large, and to further the interests and prestige of his profession. He was very quick at reaching the kernel of a problem, however complicated, and he always expressed his views with admirable clearness and brevity. To any scheme which had for its object the advancement of the medical branches of the Defence Services he gave his whole-hearted support. He possessed many statesmanlike qualities, and during the years to which I refer had a more lively appreciation of the dangerous position of his country than was usually held at that time. I used to think that he would make an excellent Member of Parliament. He was delightful to work with, and I retain very pleasant memories of my association with him. His passing at this time is a grievous loss to the profession.

THE FIGHT AGAINST RHEUMATISM

The seventh completed year of the Empire Rheumatism Council is the subject of a report by Lord Horder, its chairman, who comments upon the reduction in the annual number of deaths from acute rheumatism (which may be taken as largely synonymous with juvenile rheumatism) in England and Wales during the five-year period 1938–42. The number fell by almost exactly 50%. Corroborative evidence of the gradual conquest of this form of rheumatism is forthcoming from the Council's Research Foundation, which shows that the incidence of acute rheumatism among a large number of youths has steadily declined during recent years. This decline coincides with an increasing measure of effective control and treatment so far as the child is concerned. On the other hand, for adult rheumatism the means of effective treatment have been available for only a small percentage of sufferers, and here there is no evidence of decrease. The treatment centres report great increases in the number of patients seeking treatment; in one London hospital the number treated in 1943 was almost double that for 1942.

Clinical and Laboratory Investigations

The Council, in spite of obvious wartime difficulties, manages to keep going a considerable amount of research, both laboratory and clinical. The laboratory work has included flocculation tests of an antibody in certain rheumatic sera and antihistase titration and serum treatment, and the clinical research a study of the value and correct dosage of gold salts in the treatment of some forms of rheumatic disease, and into the efficacy of an enzyme preparation. Attention is drawn to the great difficulty in carrying clinical investigations to conclusive results owing to the lack of centres at which tests can be done under adequate control conditions among

considerable groups of patients for a sufficient length of time. It is hoped that the promised post-war development of national health services will remedy this. The council is expecting shortly to have direct discussion with the Minister of Health concerning the assurance given more than two years ago of the Government's intention in its national health policy to ensure that everyone will receive treatment appropriate to his needs. Mention is made of a report from Moscow of a discovery by Bogolometz, of the Russian Academy, of a serum which is claimed to have definite effects in the treatment of arthritic conditions arising from rheumatic disease. Lord Horder has communicated with this Russian scientist asking for further particulars, and inquiring whether it is possible to send a supply of the serum for test.

NEW YEAR HONOURS

The names of the following members of the medical profession were included in the final section of the New Year Honours List published in the *London Gazette* of Jan. 4:

O.B.E. (Civil Division)

THOMAS RICHARD WEBSTER ATKINS, L.R.C.P.&S.Ed. Ship Surgeon, Merchant Navy.

FRANK SEBASTIAN COOKSEY, M.D. Medical Officer of the Rehabilitation Department, Horton Emergency Hospital.

GEORGE MACFEAT, M.B., C.M. For public services in Lanarkshire.

JOHN CHANCELLOR MCKENZIE, M.B., Ch.B., J.P. Commissioner of Medical Services, Scotland Region, Ministry of Pensions.

EDWARD LOGGIE MIDDLETON, M.D., D.P.H. H.M. Medical Inspector of Factories, Ministry of Labour and National Service.

WILLIAM JOHN RICHARD, M.B., C.M., F.R.F.P.S. Medical Superintendent, Emergency Hospital, Law Junction, Lanarkshire.

JANET MARIA VAUGHAN, D.M., F.R.C.P. Organizer of the Royal Naval Blood Transfusion Service Centre.

MRS. MARTHA ISABEL GARVICE, M.B.E. Senior Lady Medical Officer, Egyptian Ministry of Education.

M.B.E. (Civil Division)

MRS. HARRIET MINNIE LEVICK, M.D. County Borough Organizer, Middlesbrough, Women's Voluntary Services for Civil Defence.

GERALD EARL THORNTON, M.B., B.Ch. Chairman, Air Training Corps Local Committee, Salisbury.

TRELOAR CRIPPLES' HOSPITAL

It is hard to realize that it is 35 years since Sir William Treloar at the London Mansion House planned what is now called Lord Mayor Treloar Cripples' Hospital and College (the college is for training boys in various trades) under the medical superintendency of Sir Henry Gauvain. At first cases of non-pulmonary tuberculosis were received at Alton, and afterwards the benefits of the hospital came to be extended to all the crippling diseases of childhood. Portsmouth was the area which benefited first, then the whole of Hampshire and the Isle of Wight, and now patients are taken from any part of the country or the Empire, though, of course, the after-care of distant patients has to be delegated to others. The help of the plastic surgeon has been increasingly invoked, first to treat facial disfigurements the results of lupus vulgaris, then all kinds of congenital or acquired deformities or deviations affecting the appearance. The latest medical report states that during the year 112 plastic cases were admitted and underwent 163 successful operations. The applications for admission for cases of tuberculosis of the bones and joints are rapidly diminishing—for example, the percentage of admissions for tuberculous disease of the spine, which was 40 in 1912, was down to 3.6 in 1942. Of the other cases admitted during the year under review 234 were of an orthopaedic character. About 3,500 splints and surgical appliances were made and repaired in the splint shop, and nearly 7,000 treatments were given in the light department. Out-patient clinics are held regularly in 14 towns within reasonable distance of Alton.

Continuing its practice of issuing small, neat, but comprehensive leaflets of advice on health matters, the Central Council for Health Education has chosen the title "'Right Dress' for Health" for a most useful one on the way to dress in differing temperatures. "Just Nerves" is a good title for advice to the "worriers" of this world, while "War on Disease," as its name suggests, covers infectious diseases generally. All these leaflets, as well as one on "How to Avoid Influenza," may be obtained from the offices of the Central Council, Tavistock House, Tavistock Square, W.C.1.

Correspondence

Consultant and Specialist Services

SIR,—In March, 1943, at the invitation of the Minister of Health, the Royal Colleges combined with the British Medical Association and other bodies to form a Representative Committee in order to discuss with the Minister the formation of a comprehensive medical service. Apart from the common duty of planning this service for the country, the Colleges have a particular responsibility in regard to the consultant and specialist services, and we think it right to explain what we have done to discharge that responsibility.

In the first place, when the Standing Joint Committee of the three Royal Colleges requires information and advice in matters concerning the special branches of medicine and surgery it refers to the official bodies representing those branches.

The College members of the Representative Committee are briefed and advised by an existing committee of the Colleges. This committee consists of: (1) 13 representatives of the Royal Colleges; (2) 2 representatives nominated by the teaching hospitals of each University in England, Wales, and Northern Ireland; (3) 11 representatives from the non-teaching hospitals; (4) 1 representative from each of the specialties.

This committee, apart from its representative character, provides machinery for referring questions to its constituent bodies—an essential provision, in our judgment, of any committee which sets out to give advice on such important matters as terms and conditions of service. By these means the Colleges hope to keep in touch with the views of consultants and specialists throughout the country, so that they may give effect to them in any action they may take.

The Colleges have also taken steps to ascertain what consultants and specialists are available at the present time. It is clear that the Minister of Health must know how many consultants there are and where they are available, and he is having a survey made under the direct auspices of the Royal Colleges, who are acting in this matter in co-operation with the Universities and representatives of the British Medical Association. The result of this survey will not be published; it is for the personal guidance of the Minister.

Previously, the Colleges had laid down certain standards which they thought should be required of any practitioner who wished to become a consultant in the future. These criteria are not meant to be retrospective. They will only affect those taking up consultant work in time to come. The only criterion required now is that a man is accepted as a consultant by the practitioners in his neighbourhood. Each district is therefore being asked to supply the necessary information.

In our view, the services of every consultant who is now recognized as such by the profession in his neighbourhood will be needed in any consultant service that may be set up after the war. We think it probable that provision may be made which will enable practitioners who hitherto have not been exclusively engaged in consulting practice to devote themselves solely to consulting work.—We are, etc.,

MORAN,
President of the Royal College of Physicians.
ALFRED WEBB-JOHNSON,
President of the Royal College of Surgeons.
EARDLEY HOLLAND,
President of the Royal College of Obstetricians and Gynaecologists.

London.

*** It is useful to recall in this connexion the procedure which the B.M.A. has decided to follow in order to ascertain and express the views of the profession as a whole on the White Paper. It was described in the *Supplement* of Jan. 1, and is summarized under "Future Procedure" in an important letter sent to all practitioners serving over-seas and to all medical prisoners of war. This letter is reproduced in full in the *Supplement* this week. It will be seen that the proposed procedure includes the issue of a questionary, prepared by an independent expert body, to every member of the profession

at home or abroad, whether member or non-member of the Association. The whole question of the machinery for establishing a consultants list or lists is now under consideration by the B.M.A., and in due course a statement will be made. —ED., *B.M.J*

The Prisoner-of-War Mentality

SIR,—I have read, as thousands of others have read, Major P. H. Newman's human and thoughtful article (Jan. 1, p. 8), and it assuredly must have set many heart-cords in vibration. Masterly though his impressions are, they give but part of the picture which is yet to be revealed to us, for I assume he has no experience beyond the prisoner-of-war mentality in respect of Europe.

As no Service prisoners of war have been exchanged by the Japanese, and as only a mere handful have escaped (and so far as I know none of these were doctors), we still have yet to learn how the 130,000 prisoners and internees stood up in the three stages outlined and how they will react in Stage IV—the repatriation period. It is the "lengthy period of boredom," already amounting to two unrelieved years, which must leave its permanent marks on these men and women, for the Japanese have studied how best to inflict mental anguish on their captives as opposed to the physical atrocities described in the House of Commons and elsewhere, and such anguish dates right from the "breaking-in period" and must accentuate mental symptoms; witness their refusal to allow International Red Cross delegates to visit camps, their refusal to accept parcels, comforts, and medical supplies, their holding back of some quarter of a million letters from relatives to prisoners, their refusal to recognize any messages to prisoners other than twenty-five words on a card at monthly intervals, and so on, all of these inflictions costing the captors nothing but meaning so much to the mentality of the prisoner. These are very, very slow wearing-down cruelties, the relief of which can result in no "acute emotional reaction" but a chronic psychological stigma.

On Jan. 1, 1944, a card was received from a prisoner of war, Hong Kong, in which he states that no educational facilities are allowed; most of the time was spent in playing chess, presumably with home-made pieces. It is significant that this and many other cards in this recent batch bear no dates; in any event such news as comes or goes is well over six months old—another cheap and studied way to promote anxiety.

There is only one class of man or woman who can experience all this (and much more) and who can be rehabilitated to fit into normal reconstructed society again—and that is the "superman." The remainder will be a problem for their lifetime.

The suggestion for an organization for the aid of returned prisoners of war is an admirable one; indeed, such a formation will probably be essential; but it is doubtful whether it is desirable to form yet another body. The Government Departments—Navy, Army, Air Force, and others—cannot dump these men ashore, demobilize them, and so wash their hands of it all. Such a mechanism surely exists in the War Organization of the British Red Cross Society and Order of St. John of Jerusalem, for which body our prisoners have the highest regard and affection, and to whom they and their relatives would naturally turn for any subsequent assistance. The medical personnel, particularly on its psychological side, may need amending for this purpose, but there are offices already in all large towns—e.g., over 100,000 population—and smaller, and, moreover, the organization is world-wide.

But before any of this can be arranged we still have to wait and see what these Asiatic barbarians will do to our prisoners as the war progresses.—I am, etc.,

Petts Wood, Kent. B. RICHARDSON BILLINGS.

School Medical Service

SIR,—Ever since the inauguration of the School Medical Service school medical officers have frequently drawn attention to the verminous conditions so prevalent among large numbers of the children attending the public elementary schools. Though public opinion was scarcely affected by such reports it was exceedingly stirred as a result of the publicity given to these matters following the Government's evacuation scheme. The Ministry of Health and the Board of Education then addressed special memoranda to local authorities on the matter, and authorized the appointment of additional staff in an endeavour to cope with the situation. The cumbersome Scabies Order was also issued (under the Defence of the Realm Regulations) to strengthen the hands of those who had to deal with the unwholesome conditions. In view of these circumstances it is surprising to find that Section 52 of the Education Bill, if allowed to become law, will seriously curtail the existing powers of school medical officers and nurses and transfer them to the head teachers, who are to be judges, juries, and appellates. If this reactionary section is not drastically amended an absurd position will arise whereby regular cleanliness surveys by the school nurses will no longer be possible. In consequence of this many primary-school children with negligent parents will almost certainly revert to that disgraceful condition so frequently met with in the first few years after the inception of the School Medical Service.—I am, etc.,

Liverpool. R. GAMLIN.

Aetiology of Sciatic Pain

SIR,—It would be a sad thing for the many sufferers from sciatic pain in this country if their doctors took notice of the so-called "rational" treatment advised by Sir Arthur Hurst (Dec. 18, p. 773). They would have to be told first that their pain was imagined; secondly, that the only thing for it if they persisted in believing in its existence was prolonged rest in bed perhaps with their hips and affected limb encased in plaster-of-Paris; and, thirdly, that if they still complained of pain they would be handed over to a neurosurgeon to have a severe operation on the spine for removal of a node on an intervertebral disk. It is perhaps useful to "debunk," as Sir Arthur Hurst does, the treatments of the past—notably introduced, as it happened, mainly by physicians. It is another and quite unjustifiable thing to state a treatment having, except in one part, no apparent rational basis whatever.

There is no more important subject in medicine to-day than backache with associated pain in the limbs, because of the amount of disablement and loss of work it entails. It is absurd and unkind to brush it aside as hysterical. Mainly through the work of orthopaedic surgeons and of some radiologists and pathologists, a great deal more is known about this subject now than formerly. It is certain that there are a number of physical causes which can be readily determined by thorough examination, and that pure hysteria and malingering are rare. In 20 years of orthopaedic practice I have dealt with an estimated 7,000 cases of backache with or without radiating pain, and for the last 10 years have treated not fewer than 500 to 600 a year. I have rarely seen a case without a physical basis for the symptoms, though, as in all clinical states, the reaction of patients to pain varies, and there is in many cases an associated psychological factor.

It is a pity to find the term "sciatica" still being used in your *Journal*. It is in use by the public to describe any pain in the leg (and even elsewhere!) and many doctors are nearly as vague. Sciatic pain is felt only in the buttock, outer and/or posterior aspect of the thigh and calf, and outer side of the foot. Sufficient is known now of the causes of pain in this distribution to make it as unjustifiable to use the term "sciatica" as if it were a single disease as to speak of abdominal pain instead of the different lesions which may be manifested by such pain. It is clear that sciatic pain may arise either (1) from an inflammatory or traumatic lesion of the fibrous tissue of the ligaments or fasciae in the lumbo-sacral and gluteal regions, or (2) from irritation of the roots of the lumbo-sacral plexus. The former includes fibrositis with or without localized tender points and fibrosis of ligaments following sprain or associated with disease of the bones or joints. Fibrositis may be doubtful in its aetiology and pathology, but there is no doubt that it is a definite physical disorder. Chronic sprain in the lower back may be caused by accidental injury, persistent occupational strain, or strain from deformity —postural, congenital, or due to neoplastic, tuberculous, or other disease—or to degeneration of the intervertebral disks. The various states included in this category, especially fibrositis and osteo-arthritis without or with degeneration of the disks (spondylosis deformans), are certainly the most common causes

of low back and sciatic pain, as they are of similar pain at higher levels of the trunk and in the neck and upper limbs. The distinguishing character of sciatic and other radiating pain from these lesions is that it is purely "referred," not accompanied by objective neurological signs, though there may be subjective symptoms. Appropriate orthopaedic treatment, after determination and elimination when possible of aetiological factors such as focal sepsis, gives relief of pain in most cases.

Sciatic pain is far less often due to irritation of the roots or trunks of the lumbo-sacral plexus. Such irritation may arise from a rupture into the vertebral canal of the intervertebral disk between the fourth and fifth lumbar or the fifth lumbar and first sacral vertebrae, or from perineuritis, as well as from rarer lesions such as neoplasms and arachnoiditis. I believe that posterior disk rupture is not so common as some enthusiasts consider, and that there is a danger of many spines being operated upon unnecessarily if cases of persistent sciatic pain are thought to be only neurosurgical, and if reliance in diagnosis is placed only on neurological signs. Having made, as a B.M.A. Research grantee, between 1926 and 1931 a study of the intervertebral disks and of the work of the few others in the world interested in the subject at that time, I have since then been on the look-out for cases of posterior disk rupture. Yet between July, 1937, when I diagnosed and treated perhaps the first case operated upon in this country, and the present time I had only 20 certain cases of this lesion (including one in the cervical and one in the thoracic region) out of some 4,000 cases of backache with or without radiating pain—that is, 0.5%. Considering only cases with sciatic pain, the incidence of disk rupture would, of course, be higher, but probably not more than 2% of all such cases. Disk rupture is scarcely to be considered as a possible cause of pain of recent onset in patients over the age of 40 years, as by then the disks have become too fibrous to be ruptured. Between the ages of 20 and 30, when the disks are highly elastic and still have soft centres but the spine has not quite the same resilience to trauma as in earlier years, is the period when disk rupture and the pain it may cause are most likely to occur.

Perineuritis of the sciatic nerve roots—so-called true sciatica—may never have been demonstrated, but I believe that it does occur, though it is certainly one of the less common causes of sciatic pain. By sciatic perineuritis I understand a condition with an identical clinical picture to posterior disk rupture but distinguishable from it. Both show, in addition to the typical pain in the limb, impaired or absent sensibility to pain and touch in the same distribution to a greater or less extent, diminished or absent ankle-jerk, and deviation of the trunk to the affected side in all positions or at least in bending forward when standing. In my observation these are the only states of sciatic pain which give pain *in the leg* on straight leg raising: in sacro-iliac lesions the pain is localized to over the sacro-iliac joint; in fibrositis and sprain in the gluteal or lumbar region it is also localized and corresponds with the tender points; other causes of sciatic pain do not give this sign at all. Myelography with iodized oil is the only positive way of distinguishing between perineuritis and disk rupture, as it shows up the rupture, but it is not infallible and should probably in any case be followed by laminectomy, as the oil may cause arachnoiditis if left in. For this reason it should be the last means of diagnosis after all causes of pain other than disk rupture have been eliminated. Another way of distinguishing between these two states is by epidural injection of local anaesthetic in saline into the sacral canal. The symptoms of many cases of perineuritis will disappear spontaneously with the elimination of remote focal sepsis. If they persist, epidural injection is usually effective immediately and permanently, but it has no effect in cases of disk rupture. I have made this injection in many cases and am sure that the effect is not merely psychological. It is not certain how it acts any more than it is clear how other medical empirical treatments of proved efficacy act.

Of course there is often a psychological factor in sciatic pain, but it is no more significant in such cases than in other clinical states. To maintain that it is the chief or only factor is an attitude of despair—or of vain hope—towards an important cause of suffering and disablement. To put patients to bed without an exact diagnosis may by chance relieve the pain of a few, but for most wastes time and money and impairs the prospect of obtaining lasting relief by thorough investigation and treatment.—I am, etc.,

Bournemouth. N. ROSS SMITH.

Sciatica

SIR,—Sir Arthur Hurst, in his masterly survey of sciatica (Dec. 18, p. 773), appeared to establish the existence of a hysterical background—i.e., a psychical factor in the cause of the disorder—but in his remarks on treatment he entirely ignored any psychological approach to this factor. Physical trauma or exposure to the elements were assumed to be the cause of this admittedly semi-hysterical disease, and the psychological aspect was dealt with by forms of suggestion, more or less drastic, and directed towards the developed condition rather than towards a possible psychological cause.

The trauma complained of by the sciatica patient is reminiscent of the individual who contracted gonorrhoea by "straining himself," and the exposure, usually an imaginary draught, is similar to that blamed for the onset of facial neuralgia. An incontrovertible, severe, physical catastrophe—such as the kick of a horse, a fall from a two-story building, or a night spent lost on a mountain—rarely precedes either disease.

Those of us who have acquired a psychosomatic outlook believe that not only is the discovery of infidelity in a wife or the fear of impending bankruptcy more potent to lead us to becoming generally "run down" than excessive physical exercise, but that particular forms of mental strain and emotion appear to cause stress on specific parts of the organism, and result in definite types of disease or disorder. Treatment then indicates investigation with a view to unveiling: "What did he experience just before he took sciatica, and what emotions did he feel?" While it is true that a happening sufficiently severe to cause physical illness is invariably repressed and positive transference must be established to find it, the quest does not demand forty séances. It is often possible to reveal the upset and discuss the patient's future adjustment to it, all inside half an hour, especially if one has some knowledge of the emotion associated with the disorder under consideration.

A. B., an actor, comes home from tour to find his wife leaving the house with another man (on her way to take up residence with him) and taking her three children with her. Within a few days A. B. has pain extending from the left hip to the great toe. Two weeks later he is sent to hospital, where he receives treatment covering a wide range. He remains off work for five months, and in the course of the following six years has many recurrences, being off work in all nearly eighteen months. Superficial analysis of his thoughts and emotions: "The foundation of his life was no longer secure; deprivation of loved persons; loss of self-respect; desire to strike back." The experiences of patients just preceding the first attack of sciatica may be of infinite variety, but the emotions and feelings are of the same order. Permanent cure follows the regaining of solid ground under his feet with capacity for adjustment to his future.—I am, etc.,

Glasgow. G. GLADSTONE ROBERTSON.

The Cardiac Index

SIR,—Mr. Harold Dodd in his paper on the cardiac index (Dec. 25, p. 811) remarks that "it is seldom taught, and, because of this, when it is mentioned it meets with some scepticism." What this index represents is not clear; empirically it is stated that values above 100% and below 25% make the patient a poor surgical risk. "Abdominal distension, chestiness, pulmonary embolism, delirium, strangeness of manner, or sepsis" are given as post-operative sequelae of a too low or too high cardiac index.

To quote his example: "In elderly people the blood pressure is often around 140/70, giving a cardiac index of 100%" (i.e., abnormal and a contraindication to operation). Such a pressure is, of course, perfectly normal in an elderly patient; but he goes on to say that "pre-operative rest in bed for one, two, or three weeks, with a fluid intake of 6 to 8 pints daily and cardiac tonics, approximates these figures to, say, 130/80." It is well known that variations of ten points either

way may occur from day to day and from observer to observer; certainly such changes of themselves could not be taken to indicate any alteration in the efficiency of the cardiovascular system. What cardiac tonics are used? And what are "gentle" cardiac tonics? Why 6 to 8 pints of fluid a day? It is difficult to understand how such quantities of fluids are going to benefit a patient with fibrillation, as restriction of fluid is one of the standbys of treatment of the failing heart. Clinical details are not given, but if these patients were not in failure, then cardiac tonics and excess fluid do not seem to have been indicated for patients where fibrillation was apparently paroxysmal. In any case I imagine that different observers would arrive at widely varying cardiac indices when confronted with a fibrillating heart.

The statement that "the blood-pressure figures in themselves mean little" is most disturbing. A simple example will indicate the danger of such an assumption. A patient might be in marked left ventricular failure with a blood pressure of 200/140. This would give, according to definition, a cardiac index of 43%, which indicates a "fair surgical risk." Were the cardiac index to be generally adopted as an important criterion of operative risk—and, as Mr. Dodd makes little mention of other findings in his patients, one assumes that he attaches great importance to it—one hesitates to think of the large number of patients denied operation when urgently needed, and the equally large number who would be operated on when in no fit state.—I am, etc.,

Botleys Park, Surrey. G. R. FEARNLEY.

Blood Pressure in Surgery

SIR,—All anaesthetists will agree with Mr. Harold Dodd (Dec. 25, p. 811) in stressing the importance of continuous blood-pressure and pulse-rate recordings during major operations. It is hoped that the combined anaesthetic charts and record cards designed by Dr. M. D. Nosworthy and now being tried out in many hospitals will soon become universally used.

Mr. Dodd places considerable reliance on the "Moots-McKesson cardiac index," saying that if it is below 33% or over 85% the post-operative outlook is poor. Unfortunately anaesthetists generally have been unable to place much confidence in any of the usual cardiac efficiency tests, such as those of Barach, Crampton, Moots, and Sebrasez. The Crampton test would seem to be the most scientific and has been adopted by the Athletic Association of America. It is not, however, applicable to bedridden patients. Dr. W. S. Sykes made an investigation of Barach's and Moots's tests in patients dying from cardiac failure in the medical wards of a large hospital. In no less than 62% of tests the results were misleading, one patient being deemed "operable" by both formulae 15 minutes before death. Might I suggest, therefore, that it is unwise to put these so-called tests and indices before clinical observation and experience.

It is not always realized that there is no such thing as a patient who is "so ill that he cannot stand the anaesthetic." Any patient with cardiac failure who is not *in articulo mortis* will improve temporarily under an inhalation anaesthesia, which begins with 100% oxygen in a closed circuit to which the anaesthetic agent is gradually added in minimal dosage. The question which so often faces the modern anaesthetist is not "Can this patient survive my anaesthetic?" but "Can I improve his general condition sufficiently to enable him to withstand the surgical trauma and to live long enough to benefit by the effects of the operation?" If the answer is not a reasonably certain "Yes," surgical interference is surely unjustifiable.—I am, etc.,

St. Albans, Herts. C. LANGTON HEWER.

The "Surgical" Heart

SIR,—In his article in your issue of Dec. 25 Mr. Harold Dodd states that the Moots-McKesson "cardiac index" meets with some scepticism because it is seldom taught. It seems possible, however, that its unpopularity is based on a natural distrust of any formula which seeks to reduce a complicated problem to a simple rule-of-thumb. Measurement of the arterial blood pressure cannot reasonably be expected to replace the need for an accurate cardiac diagnosis, even for surgical purposes.

It is common to find a normal cardiac index although gross cardiovascular disease is present; this is so in many cases of coronary arterial disease (including not a few cases of recent coronary thrombosis), in most mitral lesions, in cardio-aortic syphilis without aortic incompetence but with or without aneurysmal dilatation (which may be on the point of rupture), and in the majority of cases of congenital heart disease (possibly with bacterial endocarditis). It would not be justifiable to consider all such cases fit for operation because the cardiac index was normal. On the other hand, a common cause of a high cardiac index is the rise of systolic pressure which so often occurs during examination, and this is, of course, not a contraindication to operation. On the basis of the cardiac index alone a large proportion of cases of thyrotoxicosis would be regarded as unsuitable for operation. Patients with aortic incompetence, aortic stenosis, patent ductus arteriosus, or peripheral arteriosclerosis should not be regarded as unfit for operation solely on account of the abnormal relationship of systolic and diastolic arterial pressures.

No one could take exception to the suggestion that the blood pressure should be taken as a routine before operation, but this should surely be regarded as one item in the routine pre-operative examination of *all* systems and not as replacing the "clinical examination of the heart and pulse."—I am, etc.,

A. MORGAN JONES.

Cardiographic Department, Manchester Royal Infirmary.

Digitalis a Cardiac Tonic?

SIR,—I have read with interest Mr. Harold Dodd's article on blood pressure and the cardiac index. I must protest at his inclusion of digitalis as a "cardiac tonic." It is well known that digitalis is a cardiac poison, and it is to the effect on the conductivity of the neuromuscular tissues that its therapeutic action in auricular fibrillation is due. Linnell and Thomson (Nov. 6, p. 573) have indicated its uselessness in many other forms of cardiovascular defect.—I am, etc.,

Seascale. L. GOLDMAN.

Treatment of Facial Palsy

SIR,—In his letter to the *Journal* of Dec. 25 Dr. Wilfred Harris has taken the statement, "The test for faradic excitability does not provide any useful information in forming a prognosis," apart from the context and has expressed his disagreement. The statement is not given as the opinion of the annotator but is the conclusion reached by Dr. Karsten Kettel from his investigation of the late results in 264 cases of facial palsy, and it is therefore fair to give his reason for reaching this conclusion. He says:

"In half my cases the paralysis was partial and the faradic test presumably positive, even if in a greatly lowered degree. Since the final result in half the cases of partial paralysis—that is, one-fourth of the total number in this group—was nevertheless bad, it is obvious that the faradic test cannot be a reliable indicator. It is possible that a completely negative test may provide a hint. The fact that the faradic excitability is only reduced does not permit any prognostic conclusion."

On the other hand, the long experience of so distinguished a neurologist as Dr. Wilfred Harris is conclusive. It seems, however, that Dr. Harris refers to cases of Bell's palsy without middle-ear disease, whereas the cases followed up by Dr. Kettel were all secondary either to middle-ear disease or to operative treatment for its relief, and consequently were cases with a greater or less degree of pathological change in the temporal bone as well as in the nerve itself. This may perhaps explain the discrepancy between the observations of Dr. Harris and of Dr. Kettel, and it would no doubt be of interest to your readers to know if this explanation commends itself to Dr. Harris.—I am, etc.,

YOUR ANNOTATOR.

Blast Perforation of Ear-drums

SIR,—In the *Journal* of Aug. 21, 1943 (p. 233), Capt. G. W. Palmer reports his findings in 60 cases showing blast perforation of the ear-drum, and concludes that the proportion of infection to be expected is 35 to 40%, "under the most ideal conditions." Some months ago I had the opportunity of examining a similar, though smaller, group of cases, when ten men were admitted to a military hospital following an

explosion in a confined space. Their ears were examined on the day after the occurrence; in all, there were 15 perforated drums, only one having no perforation. In 50% the perforation was in the antero-inferior quadrant, one case showing an anterior and a posterior perforation on both sides. In nine ears there was wax and/or blood-clot, and this was carefully removed with Jobson's wax scoop. No ear was syringed, either at the time or later, and no local treatment of any sort employed, except that a piece of sterile cotton-wool was placed in the concha. All cases received chemotherapy for their associated injuries.

No case became infected up to ten days after injury, when the majority of the patients were evacuated: one ear showed a slight blood-stained discharge coming from a piece of blood-clot in the tympanum, which was difficult to remove, but this cleared up in four days. One man with a large dry perforation infected the ear through taking a shower bath two weeks after his injury; the infection was a severe one, and a cortical mastoidectomy was eventually necessary. It has been my experience that a higher proportion of surgical mastoiditis is found in infected "blast" ears than in cases of ordinary otitis media.

In my opinion, if local treatment is restricted to the early removal of wax, blood, and debris, a lower infection rate than that given by Capt. Palmer can be expected.—I am, etc.,

B. S. CARTER,
T/Major, R.A.M.C.

Tonsillectomy in Children

SIR,—Though whole-heartedly in favour of leaving tonsils in unless there are very definite local indications for their removal, I am sorry to see that your annotation of Sept. 11 (p. 334) accepts statements such as the following: "The sickness experience of the tonsillectomized group was no better than that of children in whom there had been no operation." I beg to point out that there are some serious fallacies in such a conclusion.

1. Tonsillectomy is very frequently incomplete. Some of the largest and most septic tonsils are to be found in children who have had their tonsils "removed." Many studies, therefore, merely compare the health of children whose tonsils were never removed with that of children who, in spite of operation, still have septic tonsils.

2. It is obvious that in the tonsillectomized group there must have been some sort of reason for the operation, such as recurrent colds or coughs. It is a fair assumption that in a high proportion of the non-tonsillectomized group there was no such condition. It is therefore meaningless to compare the health of one group after the operation with that of another, more healthy, group which had no operation.

3. Sinus infection is very frequently the cause of the symptoms for which the tonsillectomy is (wrongly) advised. The symptoms and effects of sinus infection are not relieved by tonsillectomy. Studies of the effect of tonsillectomy without the elimination of a possible sinus infection are valueless.

4. Important causes of the apparent failure of the operation are: (*a*) persistence of haemolytic streptococcal infection in the throat, shown by Kaiser and others to be common; and (*b*) a common complication of tonsillectomy—infection of the nasal sinuses. Studies of the subsequent health of tonsillectomized children, with very few exceptions, do not take these factors into account.

The many large-scale studies which I have read are as fallacious to my mind as would be the comparison of the health of a group of patients who had had no stomach operation with that of a group which had had an unspecified operation on the stomach for unspecified symptoms and disease, with unspecified complications and associated infections, and without mention of the completeness or otherwise of the removal of gastric or malignant tissue. What is required is a large-scale study of the health of children who, having no pre-existing or complicating sinus infection, have had, for specified conditions such as nephritis or recurrent colds, a tonsillectomy completely and correctly performed, with elimination of the pre-existing infection, as compared with the health of a similar group of children who, with the same condition, chose to keep the tonsils in and rely on medical and general treatment only. I look forward to seeing such a study.

In addition, it would be interesting to compare the disease experience of children who have had an unsuccessful tonsillectomy, which has failed for the reasons mentioned, with that of children in which the operation was "successful." A mere investigation of the frequency of disease before and after tonsillectomy is fallacious for another reason—the fact that the child is older after tonsillectomy than before it, with all that that implies in altered environmental and other conditions.

I regret that the value of a recent paper of mine (*Lancet*, 1939, **2**, 1013) on the role of tonsillectomy in nephritis was negatived by these very fallacies.—I am, etc.,

R. S. ILLINGWORTH.

Mastoiditis in Infants

SIR,—I note in Dr. P. W. Leathart's article on a common cause of diarrhoea, vomiting, and dehydration in infants (Aug. 7, 1943, p. 168) the following statement: "We may conclude, therefore, that mastoiditis is commonly caused by milk, vomit, or infected mucus entering the Eustachian tube in children who are either too young or too ill to sit up, and are accordingly nursed and perhaps fed while lying on their backs." In five years' busy practice in this area, containing 50,000 people who treat their young and sick children as described, I have not seen one case of acute mastoiditis. Possibly one case a year occurs for the whole city and surrounding district. I conclude, therefore, that some additional factor is required in young and sick children.—I am, etc.,

Rockhampton, Queensland, Australia. R. PALMERSTON RUNDLE.

The Psychological Approach to Illness

SIR,—It is regrettable that there is such a gulf between the skilled psychotherapist and his medical colleagues, and that the general principles of the psychological approach to illness are not more widely taught. The proportion of medical psychologists to the rest of the profession is very small indeed—far too small to deal with the cases that should be referred to them. But before patients can be sent to the psychologist they must be recognized as suitable cases, so that some knowledge of psychology is essential to surgeon, physician, and general practitioner alike. How many deflected septa and appendices would be left alone; how many "cardiacs" would live a full life; how many gastritis, headache, lumbago, and colitis cases would be recognized for what they really are, if this outlook were more general? Many cases of neurosis can be greatly helped without any elaborate knowledge of psychotherapy, and many patients can be prevented from developing neurosis by early explanation and guidance. Here is the G.P.'s opportunity and duty.

A simple example of this, but in my opinion a very important one, is in ensuring the right attitude of the "toddler" to his new baby brother or sister. Many parents are so stupid that without definite guidance they switch all their affection and interest to the new arrival, leaving the elder child, previously the centre of interest, lonely and forsaken. It is hard to estimate just how much harm this may do, but it is certain that the personality may be permanently affected and an anti-social reaction developed. The elder child, craving attention, may feign illness, develop enuresis, or even attempt secretly to injure the "usurper." Later on antagonism between the members of a family may persist long after the reason for it has ceased to exist. It is remarkable to know that all this may be prevented by instructing the parents how to behave to the elder child by making him a "partner" in the new baby, encouraging him to help with baby's toilet, and above all by giving him extra affection and attention. All this may seem ridiculously obvious, but how often do we do it?

From Servicemen who come to see me when on sick leave it is obvious that many cases of neurosis are unrecognized and labelled as some "itis" or other. I have recently seen two pilots who were both, as a result of their experiences, just plain scared of flying. After careful questioning they both admitted that that was their whole trouble. But had they been referred to a psychologist? No; both had been in and out of hospital for months, one labelled "chronic catarrh and sinusitis" and the other "bronchial catarrh." A sailor who was suffering from home-sickness was kept in bed for weeks with a diagnosis of "myocardial weakness." I knew the man and referred him to a cardiologist, who reported that his heart

was perfectly normal. Needless to say, such treatment does not cure the neurosis, but leads the sufferer on the way to permanent invalidism.

Have we not all at some time been guilty of accentuating and fixing a neurosis by taking the symptoms at their face value and treating them as organic? One of the worst examples of this I have seen, because it should have been so obvious, was a case of aphonia. The patient, a young woman, had suddenly found that she could speak only in a whisper. The trouble was diagnosed as laryngitis, and her tonsils were removed. She still whispered, so all her teeth followed! I saw her when she had whispered for two years, and under light hypnosis she recovered her normal voice in twenty minutes.

Failure to recognize the psychological nature of certain complaints may lead to elaborate research reaching erroneous conclusions. I have in mind various work done on the problem of enuresis. Enuresis is usually psychological in origin. I saw a girl of 20 some months ago who was living at home and wetting the bed every night. I advised her to join the Services, which she did reluctantly, fearing to disgrace herself. I saw her recently. She is well and happy and the enuresis ceased from the time she left home. Yet we still read articles describing experiments with this and that drug, comparing results with different techniques. But when good results are obtained they are due to the suggestion of cure given by the doctor. Hence the wide divergences of results as shown by the statistics of different workers.

What I plead for, as a humble general practitioner, is a wider teaching of the psychological outlook, so that we may not encourage neurosis but help to eliminate it. A few lectures given as part of the degree course by a psychiatrist whose job is to deal with the pathological mental case are not enough. What is needed is teaching by a psychotherapist burning with zeal for his subject. How well I remember, twenty years ago, attending a course of lectures at Birmingham University given by real enthusiasts, including Hadfield, Bernard Hart, and Crichton-Miller. The whole subject is so absorbingly interesting that if presented properly the student could not fail to learn. Could not one of the outstanding men with a gift for lecturing tour the universities and so revolutionize the outlook of the student? This is not just another subject to be crammed into the medical curriculum, but a question of giving the next generation of doctors a more balanced outlook on medicine and a wider understanding of their patients as individuals rather than as cases.—I am, etc.,

Halesowen, Worcs. HERBERT W. BLAND.

Shock Treatment of Mental Disorder

SIR,—In the *Journal* for Dec. 25 (p. 829) Dr. Winnicott invites discussion upon the shock treatment of mental disorder. He writes a curious letter. Indeed, if it were not for the fact that he is himself a leading exponent of Freudian doctrine, one would be tempted to suggest that the treatment in question had aroused his own unconscious hostility. If anyone was so ill advised as to voice his objections in such emotional terms to recent psycho-analytical theories, he would no doubt be referred sternly to the ascertained facts, and told that his own unconscious mind was distorting his powers of observation.

In Dr. Winnicott's eyes we must be very guilty indeed. At this hospital we have been using electrical shock therapy for 2½ years. During this period we have treated a large number of patients, mostly suffering from comparatively mild and recoverable illnesses. Our experience has taught us that the treatment is of unequalled value for cases of depression of psychotic type. Dr. Winnicott speaks of the value of recent researches in psychology, yet we ourselves have no knowledge of any other form of treatment which would cut short this disorder. Despite its recoverable nature, the duration of the attack may be exceedingly long, and our ability to terminate it quickly by shock therapy has taken a load off our shoulders, which does much to overcome our natural dislike of the method.

We have not abandoned psychotherapy; indeed, the rapid removal of the state of acute depression, during which analytical psychotherapy is largely contraindicated, has given us more time for treatment when the basic mood disturbance has been overcome.

We have used the treatment cautiously and in an experimental frame of mind in certain other types of illness. We are not at all impressed with its efficiency in exogenous anxiety states, or, indeed, in any condition in which the mood disturbance is not a fundamental feature of the illness. Far from enabling us to do our work "without having to know anything about human nature," we have found that differential diagnosis assumes a new importance. The problem of distinguishing between an essential mood disorder (an affective psychosis) and a mood disorder which is secondary to the patient's immediate preoccupations (an affective neurosis) can be very difficult indeed. For many it was once a distinction without a difference; now a correct diagnosis may lead to the rapid relief of symptoms by shock therapy in the psychosis, whereas in the neurosis this treatment is likely to make confusion worse confounded. It should be added that there are many cases in which a psychotic depression is grafted on to an underlying neurosis. In such cases the need for psychotherapy after the conclusion of shock therapy is obvious, but we believe that it is no less important in the more straightforward depressions.

We hope very shortly to have the privilege of publishing a series of cases of "mild" and recoverable disorders which have been treated at the hospital. We believe that our results have been excellent and our complications few. We welcome the introduction of a method of physical therapy which is so dramatically restorative. We believe that it represents one of the greatest milestones in the history of psychiatric treatment, and we hope that it will lead to a new understanding of the physiological processes underlying mental disorder. In fact altogether we think that Dr. Winnicott is giving a brave but rather futile imitation of King Canute.

Lastly, about the children whom Dr. Winnicott desires so earnestly to protect from this awful treatment: a moment's reflection should serve to reassure him, for as a good psychiatrist and paediatrician he will surely be aware that psychotic states of depression are exceedingly rare before puberty. As an additional point of reassurance it is noteworthy that electrical shock therapy causes the patient very little discomfort or anxiety.—We are, etc.,

C. H. ROGERSON.
B. ANDRATSCHKE.

The Cassel Hospital for Functional Nervous Disorders.

SIR,—The advocates of shock therapy are likely to react to Dr. Winnicott's scathing indictment with angry protests. But Dr. Winnicott is fundamentally right. One may go further and ask whether some of our psychiatrists are not barking up the wrong tree. Spontaneous recoveries from mental illness are not unknown, and for this reason many methods of treatment which have not produced a higher percentage of cures than no treatment at all might very well be discarded without more ado. Their success cannot be ascribed to any inherent virtue of the method. Yet some mental hospitals still advocate these methods merely because they happen to be fashionable.

Any treatment which does not "cure" as many patients as no treatment at all in the same period of time is doing definite harm. It is drawing wool over the eyes of a long-suffering public. Treatment of mental disorder by the induction of fits is indeed "a wonderful way of doing psychiatry without having to know anything about human nature." If it really is "a by-pass to true understanding of human nature," then its indiscriminate use is to be deplored. It is a fact, as Prof. Ryle states (Nov. 20), that the sciences and techniques have come to dominate medicine to the exclusion of the most important science of all—the technique of understanding. "Science without humanism may work with atoms, but it will not work with men."

The danger in the present widespread use of artificially induced fits as treatment of mental illness is that a potent therapeutic agent is put into the hands of practitioners who often have little understanding of psychotherapy and still less knowledge of human nature. As a safeguard I would suggest that the use of shock therapy should be restricted to patients who are inaccessible to other forms of treatment, that it should be followed in all cases by psychotherapy, and, most important of all, that shock treatment should be given only by practitioners who have had extensive experience of psychotherapy.—I am, etc.,

Wimborne. J. STEPHEN HORSLEY.

Population Problems of India

SIR,—Prof. Blacklock (Dec. 25, p. 805) gives a dismal future for India. He concludes that, given all the advantages that modern knowledge can give "to the betterment of the health of man by attention to the prevention of disease and to improving housing, environment, and nutrition, then India . . . will be so rapidly populated that starvation will inevitably result, and that soon." Before accepting this Malthusian prognostication and its implications there are certain facts about the productivity and population of India which should be considered.

Owing to the methods of agriculture the soil of India, which is not a poor one, is yielding less and less; manure is used as fuel and straw as cattle fodder instead of manuring the land. Owing to primitive methods and the small average area per cultivator the yield per acre is low and the labour wastage is very high. "More than one-third of the existing cultivable area in India has not yet been brought into cultivation, and the existing cultivated area is cultivated under such restricted primitive conditions as to result in a yield per acre about one-third of that obtained for a similar crop (comparing wheat yields), with less man-power, in the United Kingdom" (P. Dutt in *India To-day*).

Agricultural Area of British India, 1935-6

	Millions of Acres
Net area by professional survey	667.4
Area under forest	89.5
Not available for cultivation	145.0
Cultivable waste other than fallow	153.6
Fallow land	51.0
Net area sown with crops	227.9

(Statistical abstract for British India, 1936.)

Even under these conditions India is producing enough food to give 88% of its existing population a daily ration of 2,800 calories per head if none was exported and there was no maldistribution (Prof. Mukerjee, *Food Planning for Four Hundred Millions*, 1938). But if all the advantages of civilization envisaged by Prof. Blacklock were applied to India's agriculture we see that the country could produce nearly four and a half times as much food, which should be sufficient for a population three times that of present-day India.

As human knowledge advances the productivity of the world will increase; the recent reports published in the *Journal* on the production of protein by the use of yeast are an indication of what we can look forward to. The increase of population in India may well result in a more thickly populated India, but there are many other countries which are more densely populated, including England and Wales. The birth rate in India is apparently declining; in the decade 1901-10 it was 38, in the decade 1921-30 it was 35, and the average rate for the 5-year period 1934-8 was 34.5.—I am, etc.,

Birmingham. M. BARROW.

SIR,—In his gloomy forebodings Prof. D. B. Blacklock (Dec. 25, p. 805) having enlisted the services of pessimist Malthus, I feel constrained to reply by invoking the aid of optimist Doubleday.

Doubleday was a very worthy citizen of the city from which I write, and in *The Natural History of Population* Raymond Pearl (surely an acceptable sponsor on such a matter) says of him: "Doubleday's book, now largely forgotten and almost never read, contains with all its errors of judgment some acute observations and reasoning." The pith of Doubleday's theory, which appeared in his *The Law of Population* in 1842, is, in his own words, that "overfeeding checks increase, whilst on the other hand a limited or deficient nutriment stimulates and adds to it." In essence he seeks to establish the existence of a natural self-adjusting and variable fertility potential in the human race, and though clearly nobody would set out to claim that this theory is the whole truth, it is, at the same time, not one wholly to be dismissed. Raymond Pearl, for example, draws attention to researches of Sydenstricker's on the high expressed fertility of those on the dole, which lend colour to Doubleday's observations.

Some association between the standard of living and potential fertility such as Doubleday describes would, in due course, mitigate the miseries which Prof. Blacklock fears may arise out of the Atlantic Charter, and would render it an experiment worth pursuing.—I am, etc.,

Newcastle-upon-Tyne. IAN E. MCCRACKEN.

SIR,—You are to be congratulated on the publication of an extremely valuable and important article on the population problem in India. It is good to know that the pages of the *British Medical Journal* are available for such sound thinking. One point only calls for comment. Toward the conclusion the author says: "To what extent, if any, the frequent use of chemical or mechanical contraceptives finally impairs health is as yet by no means certain." Records at our clinic have now been accumulating for twenty-two years, and it is quite certain that though some mechanical and chemical contraceptives do have a detrimental effect on health, yet the perfectly safe occlusive method combined with a bland suppository for women need cause no anxiety, for they cause no harm.—I am, etc.,

MARIE C. STOPES,
Founder of the Mothers' Clinics.

Artificial Insemination

SIR,—Many will endorse Dr. Todhunter's courteous and timely warning (Jan. 1, p. 25) about the discussion of the pros and cons of artificial insemination. He stresses the importance of wise and true teaching and advice so far as our present knowledge takes us.

I suggest that our sins of omission are as great and far-reaching as any active false teaching, and that a brake should be applied to the development by Press comment, advertisement, radio, etc., of the increasingly prevalent idea that the medical profession has become so clever that a physical Utopia is just round the corner. We shall be blamed and seriously discounted in our efforts when the public become disillusioned, unless, meanwhile, we actively avoid any such claim to infallibility and combat false ideas already taking root.

So much excellent research has been done and is in progress that the average doctor is so busy keeping in touch with the newest therapeutic agent, with so many per cent. of indications and cures, that he tends to forget the fundamentals of anatomy, physiology, pathology, and psychology, all of which change only very little and very slowly. The reproductive function is the most important and the most mysterious in human experience. The essential basis of civilization lies in the control of intrasexual physical relationships. Therefore it becomes of extreme importance, when civilization is so precariously balanced, that the medical profession must not allow false teaching to go unanswered.

In recent years much preventable psychological uncertainty and distress have been caused by such ideas as (*a*) sterility is curable by hormones, vitamins, etc., if only the correct combination is used; (*b*) that no woman's life or even health should ever be in jeopardy in pregnancy or childbirth; (*c*) that the converse of contraception is true—i.e., that a woman can have a baby at will—to take easy examples. Perhaps that last, of all the many false notions prevalent now, causes the greatest social and psychological trauma. Nearly all young people to-day marry honestly believing that contraception for the number of years necessary to establish a material and social position is the wise and enlightened procedure. They are greatly surprised, confused, and hurt when the proposed baby does not materialize. Even at that stage they are allowed to believe that medical science can put matters right. Only sometimes is this true, and even when all means are used it remains for Nature, Providence, God, or what name you choose, to perform the miracle of conception. How much better it would be to acknowledge our fundamental ignorance, and to advise young people to marry, honestly and generously to make love, and to welcome gratefully the miraculous result! Then and only then, after the family is established, should any question of contraception be considered.

It behoves us, if we are to maintain our position as an intelligent profession, to retrace our steps a little, to accept all experimental advances only in relation to our essential bases of knowledge, and to avoid the arrogance of partial knowledge so dreadfully suggestive of Continental doctrines and of quackery.—I am, etc.,

Birmingham. J. S. M. CONNELL.

SIR,—I see no more objection to artificial insemination with the husband's semen than assisting the child into the world

with forceps. But when it comes to using "donated" semen, another question arises: What will be the status of the child? If the husband gives his name as the father he will be liable to prosecution, and if the real father's name be given or the name be omitted the child will be labelled a bastard.—I am, etc.,

Birmingham. ROBERT ANDERSON.

Consciousness in Senescence

SIR,—I have read with great interest the paper by Prof. Jefferson on the nature of concussion and your editorial on the place of consciousness (Jan. 1). I note that no reference has been made to the anatomical and physiological changes that occur in the course of senile degeneration, but the close resemblance between the manifestations of this condition and those of concussion and of cerebral lesions generally would appear to make this a very valuable field of comparative inquiry. The fitful gleams of consciousness alternating with an almost stuporous condition which occur in advanced senility, the sudden falling asleep, the disorientation, the defective ideation, and the narrowed field of consciousness are similar in old age and in traumatic cerebral conditions.

Senescence is regarded as due to an arteriopathy, and the variability of the symptoms from day to day and from hour to hour is undoubtedly due to the fact that different elements of the brain receive a different amount of blood supply from time to time. It is obvious that all levels of cerebral function are affected, from those that are associated with the higher centres, which are considered to be situated in the cortex, to the more elemental functions, which are regarded as emanating from the hypothalamic regions and the brain-stem.

From the cases of senescence which I have personally observed, my own impressions are that consciousness, in the widest sense of the term, is an extremely complicated function dependent on the integrity of the brain as a whole.—I am, etc.,

London, W.1. DORIS ODLUM.

The Nature of Concussion

SIR,—In his article Prof. Jefferson concludes that a paralytic effect upon the neurons is the prime cause, but it is not at all clear how this primary paralytic effect can be produced by the small subcortical focal lesions which he gives as examples causing stupor, nor how it is related to the stupor–recovery–stupor sequence which he knows holds the key to the problem.

Since I have shown that the function of the frog's peripheral nerve is unaltered by stretching or compression within reasonably wide limits, and Echlin has shown that slight stretching is an adequate stimulus to cause cerebral capillary constrictions, it seems more probable that the primary effect of tissue distortion by concussion, blast, or small focal lesions with surrounding oedema, is a capillary stretching and constriction. I have discussed (*B.M.J.*, 1938, **1**, 265) how patterns of capillary flow within brain tissue can influence group neuron function, and said that a normal change of pattern is allied to change of mental and emotional phenomena, so that a primary constriction of certain cerebral capillaries due to stretch, and a secondary paralysis of neuron function from capillary anaemia, elucidate the problems of stupor from subcortical lesions, and of the neurological and mental effects of concussion.—I am, etc.,

Birmingham. F. A. PICKWORTH.

Teaching of Anaesthetics

SIR,—Dr. K. G. Lloyd-Williams's letter (Dec. 25, p. 827) is both timely and welcome. Although not in agreement with it all, I most whole-heartedly agree with the urgency of a complete revision of both the teaching and the practical administration of anaesthetics. Realizing early in my career how anaesthesia can either make or mar a surgeon's best efforts, I saw that advances in surgery were difficult and hazardous if they were not supported by adequate advances in anaesthesia. After visiting many of the bigger Continental clinics over the years, it became more and more obvious that inhalation methods of anaesthesia were increasingly giving way to basal narcosis combined with peripheral infiltration, and other better and safer methods for the bigger surgical enterprises.

After giving most methods a prolonged trial—and these included all types of inhalation, spinal, paravertebral block, the barbiturates, etc.—I adopted a combination of tribromethyl alcohol and peripheral infiltration with "planocaine," and have used this for years for operations of all magnitudes, including the severest types of emergency, with results that are incomparable with any other method I have seen. For intra-abdominal work splanchnic or mesenteric block is used in addition. This combination, or improvements on it, have come to stay, and, though nearing the autumn of my years, I forecast appointments of "surgeon-anaesthetists" at our larger clinics. Let, then, the training of the anaesthetist of the future begin in the anatomy and applied physiology departments, where he or she will acquire a more accurate knowledge of the anatomy of the cutaneous sensory and splanchnic nervous systems, and a more thorough appreciation of such a vast subject as the applied physiology of shock.—I am, etc.,

Baildon, Yorks. BASIL HUGHES.

Medical Boarding for the Merchant Navy

SIR,—In recent months various letters under this heading have appeared in the *Journal*. Mr. Greany, the secretary of the Shipping Federation (Oct. 2, p. 435), indicated that the question of medical arrangements in the Merchant Navy was too lengthy and complex to be dealt with in correspondence columns, and at the same time corrected some misstatements of fact which had appeared in some of the letters.

As one who has been connected with the medical aspects of seafaring for nearly thirty years, I would like to emphasize that the Shipping Federation, the shipping companies, the Ministry of War Transport, and the various unions connected with the Merchant Navy are fully alive to the many problems about the fitness of seamen, and that the particular difficulties which have arisen owing to wartime conditions have not escaped their notice. They are all giving much attention to them, and there is active co-operation between these bodies to this end.

Dr. Royds Jones (Dec. 25, p. 831) rightly states that there has been little trouble with the regular pre-war seafaring man. The difficulties are more with those directed back to seafaring by the Ministry of Labour and those who have started seafaring since the outbreak of war. Many of the "old hands" might not have reached Grade I or II standard of the armed Forces medical boards had they been before such boards, but they have been on voyage after voyage, serving magnificently, and doing their jobs efficiently without complaint, frequently in spite of advanced age and some physical defects. Only recently I examined a boatswain who had been at sea for over fifty years, the last forty-three years with one shipping company, and thirty-five years in his last ship, only retiring at the age of 71 after an accident that was no fault of his years and which would have incapacitated a man thirty years younger. Without any hesitation I would rather trust the judgment of the Shipping Federation medical examiners and the medical officers of the various shipping companies as to the fitness or otherwise of seafaring men than the findings of the average armed Forces medical board.

Dr. Royds Jones suggests medical history cards for every man. These were started last September, and there is now a record card for each man as soon as he enters the Reserve Pool, and part of it is devoted to medical history. The findings of all examining doctors are entered on the card, and entries are also made in respect of general practitioners' certificates, hospital reports, etc. By this means a check can now be kept on those who try to "go sick" too frequently or at inconvenient times just before a ship is due to leave United Kingdom waters, and we can now take steps to prevent recurrence of some of the troubles that have existed in the past, though the malingerer or shirker will always be a difficult problem, as for obvious reasons the same action cannot be taken in the Merchant Navy as in the fighting Services, where the men are supervised and controlled whether at work or not.

Medical certificates of unfitness from general practitioners when the man is ashore are often a difficulty and do complicate the work of the Shipping Federation and shipping companies' medical officers. Under the Reserve Pool arrangements,

however, all such seamen must submit, if required, to an examination by a Reserve Pool doctor, who can, if necessary, obtain a second opinion or refer the case to the medical referee appointed by the Ministry of War Transport.

It is impossible to go into all the details of medical arrangements concerning the Merchant Navy in a letter which could be published. There are difficulties to be overcome and there are defects which are not denied, but it is quite wrong, as some of the letters have suggested, to think that those responsible are doing little or nothing about it. The whole question is constantly under review and active steps are being taken to overcome the difficulties and remedy the defects.—I am, etc.,

E. L. CALDWELL-SMITH,
Chief Medical Officer, the Shipping Federation and Merchant Navy Reserve Pool.

London, E.C.3.

Colonial Research

SIR,—The demand for research and ever more research raises the questions, "Have results justified the large sums already expended?" and "Is research organized on the right lines?" Looking back on the chief achievements in research into tropical diseases, one is struck by the fact that it was the ordinary doctor, often working single-handed and engaged in medical work, who made the outstanding contributions. Ranson, busily engaged in practice in China, discovered the role of the mosquito in filariasis; Ross, as a young I.M.S. officer in India, that of the mosquito in malaria; Forde, a medical officer on the West Coast, discovered the trypanosome of "negro lethargy"; Stannus minutely described pellagra, a disease then hardly known to English doctors, among the inmates of a gaol in Nyasaland, and discredited the maize causation theory—a discovery which has led to recognition of the disease in many parts of Africa and the U.S.A. and has stimulated much work on deficiency disease.

All these men were busily engaged in their general professional work. The true research worker is very much of an individual; his gifts seldom fructify in the atmosphere of a large fellowship. Research of this individual character, which, as Ross has recounted, often enough received little encouragement, has, I venture to say, been far more fruitful than that of large commissions, and infinitely less costly.

Nowadays the multiplicity of duties inflicted on the successors of these men almost debars reflection on what they have observed at the bedside or in the post-mortem room. They are overwhelmed by report-making, clerical duties, examinations of labourers, of officials of all races on appointment, on going on leave, on postponing of leave, by medical boards, the examination of school-children of all races, court cases, as well as by the expanding work of hospitals. I speak from recent experience in Tanganyika, where much military work also, at the moment, falls upon them.

I suggest that in the medical field far more will result from increasing the staff of district medical officers and lightening their burden of work than from appointing organized bodies of workers who are not in intimate contact with the sick. Help from specialists is, of course, required from time to time and should be obtainable from a central laboratory, and there will always be questions requiring team work for their solution. But it should be possible to relieve a man who has initiated a promising investigation from much of his general work.

The opportunity for individual research was one of the main attractions of the Colonial Medical Service. This attraction hardly exists to-day.—I am, etc.,

J. B. DAVEY
(Formerly P.M.O., Tanganyika).

Bournemouth.

Hospital Diets

SIR,—Referring to your previous correspondence on inadequate hospital diets, may I record the case of a Service patient admitted to this hospital recently from an R.A.F. hospital, which I shall leave unnamed, who had been under treatment for pulmonary tuberculosis and diabetes mellitus. He brought with him a diet sheet, a copy of which, for the purpose of refreshing and possibly tantalizing the memories of some of your readers, I append.

To counteract these daily spreads he was given 80 units of insulin. A few days on normal hospital diet—and the diet here is considered to be better than average, even by the present patients—and his daily insulin requirements were reduced to 25 units, resulting not only in a saving of insulin but a feeling of repletion after meals, and the comforting knowledge that upon discharge he will be able to obtain, and pay for, the commodities which now figure in his diet.

1st Day	2nd Day	3rd Day	4th Day	5th Day
		Breakfast		
Bacon and egg, toast and butter	Porridge, bacon, toast and butter	Scrambled egg and bacon, toast and butter	Porridge, fish or salmon (salmon and egg to bind), toast and butter	Liver and bacon or egg and bacon, toast and butter
		Lunch break: milk, half a pint, with biscuit		
		Lunch		
Steak or minced beef, potatoes, cauliflower, stewed apples, cornflour sauce	Mutton cutlet, potatoes, peas, stewed peaches	Chicken, potatoes, green vegetables, apple or prune tart	Beef stew, onions and carrots, tinned peas, potatoes and green vegetables, stewed fruit	Fish, potatoes, green vegetables, rice pudding and milk
		Tea		
Sardines, bread and butter, salad, tea	Boiled or poached egg, bread and butter, salad	Salmon, salad, bread and butter	Cheese salad, bread and butter	Cold meat or ham or tongue, bread and butter, salad
		Dinner		
Chicken or liver or lean pork, potatoes, peas, green vegetables, stewed apricots or prunes	Steamed or grilled fish, potatoes and green vegetables, Welsh rabbit	Grilled steak, onions, baked potatoes, bread-and-butter pudding	Mutton, potatoes, green vegetables, rice pudding and baked apple	Savoury mince, potatoes, carrots, fruit tart

13 oz. milk and two biscuits and butter every evening.

Perhaps there is something to be said for bad diets.—I am, etc.,

R. LIVINGSTONE,
Medical Superintendent.

Kettlewell Hospital, Swanley, Kent.

Effect of Pregnancy and Parturition on Pulmonary Tuberculosis

SIR,—In view of the increased incidence of pulmonary tuberculosis in recent years, Dr. R. C. Cohen does well to call attention in the *Journal* of Dec. 18 (p. 775) to the effect of pregnancy and parturition on pulmonary tuberculosis. His results and conclusions in those cases in which the disease is quiescent or arrested are in accordance with the views of most tuberculosis workers, but in those cases in which there is clinical or radiological evidence of active disease his conclusion that "active pulmonary disease is seldom accelerated by pregnancy and labour" is at variance with both generally accepted beliefs and the results of his own investigation. Dr. Cohen finds that out of twenty-five such cases no fewer than seven showed retrogression of the pulmonary disease, and in only two out of these seven cases was subsequent improvement noted. He does not give details of the twenty-five cases, which he has included under the heading "Progressive," and he makes no mention of having carried out any investigation of patients with similar pulmonary disease and who were not pregnant, but states that "there is no reason to assume that the disease in the former would not pursue its steady and relentless course."

It is well known that the Essex County Council Hospital, Black Notley, is an institution for early and treatable cases and not for cases of advanced disease; this being so, it would be very surprising indeed to find anything like such a high figure as 28% of their cases with active disease showing

evidence of retrogression while still undergoing sanatorium treatment. On the evidence which Dr. Cohen puts forward it would therefore seem that pregnancy and labour do in many cases have serious consequences; and his results would seem to show that in any case where a woman with active pulmonary tuberculosis is seen early in pregnancy the question of terminating the pregnancy should be very seriously considered indeed.—I am, etc.,

R. S. McDADE,
Deputy Medical Superintendent,
Essex County Hospital, Chelmsford.

Scabies

SIR,—The letters from Major Kenneth Mellanby (Dec. 18) and Dr. A. M. H. Gray (Dec. 25) following Dr. Henry MacCormac's article of Nov. 27 interested me. The City of Portsmouth instituted a central clinic for the treatment of scabies in January, 1942, and during that year treated some 5,400 cases and contacts (average, one contact to three definite cases). Great care was taken with the disinfestation of bedding and clothing. In the spring of this year, following Major Mellanby's experiments, the M.O.H. decided to omit the disinfestation of bedding and personal clothing. The number of cases treated this year seems likely to be some *550 fewer* than in 1942.

Much of this reduction may be due to our keenness in roping in and treating contacts, but, on the other hand, omission of disinfestation, if Dr. MacCormac is right, should tend to favour an increase. Actually I have had very few complaints that infestation was due to blankets (Home Guard, fire watchers, etc.), and on detailed investigation I have been unable to trace a single authenticated case. In one instance the culprit was indeed infested, but with lice. In another he was shown to be suffering from psoriasis, the diagnosis, of course, being made by the complainant. I am not suggesting that blankets never transmit scabies, but in view of the labour and petrol saved I agree with Major Mellanby that the disinfestation by a public body could be omitted. In my opinion it is far more important to see that *immediate* contacts are treated, even when, as is usually the case, they show no visible signs of scabies. I despair when a contact brings along a certificate from his doctor: "I certify that none of this family shows signs of scabies."

Like Major Mellanby I find many cases showing dermatitis from the use of sulphur—usually forearms and front of thighs—with scabies elsewhere. Out of 3,641 cases (excluding contacts) treated in 1942 83 showed dermatitis due to sulphur or dettol. I take this as an argument against the home treatment of scabies. Very few patients are conscientious enough or can be trusted to treat themselves *properly* at home.

I may say that we use a 25% solution of benzyl benzoate made up by ourselves, with two coatings given at one attendance. Occasionally I find it necessary to give a second application.—I am, etc.,

ERNEST SHAND,
Assistant Medical Officer of Health, Portsmouth.

Medicine in Persia

SIR,—The formation at Teheran in September last of an Anglo-Iranian Medical Society is, as you well say (Dec. 25, p. 820), a "pleasant instance of the close relations between this country and Persia." It is, however, so far as British medicine is concerned, but the most recent instance of many over a century and a half. Doctors are nowhere more esteemed than in the country of Avicenna, and since fully qualified Persians have, so far, been few for its vast size and difficult communications, heavy responsibilities have fallen on their foreign colleagues. The story of the work in treating the sick, in public health, and in training hospital assistants, of medical officers in British and Indian Government employ, of C.M.S. (and American) missionaries, and of doctors of undertakings such as the oil company, cannot be told now. You may, however, allow me to add a postscript to your welcome to the new society. Even it had a modest forerunner that was also of British inception. This was the Teheran Medical Society. As in September, 1943, so in March, 1924, Persians, British, and Americans were at the inaugural meeting, and also a French surgeon, a German, and, strange to say, a Japanese—the medical member of a visiting mission. Further, you name a link between the two events, for Dr. Habibi Adlé, president of the Iran Medical Society, was one of our original members. My theme leads me to add that, about the time in question, he gave up practice in Paris when, on the advice of two British medical officers who had been appointed to reorganize it, the Persian authorities nominated him the first radiologist to their hospital at Teheran. It is pleasant but no surprise to learn that his abilities have brought him high office, and that he is using it to support the new society.—I am, etc.,

A. R. NELIGAN
(One-time Physician to the British Legation at Teheran).

Droitwich.

Sulphathiazole Insufflations for Gonococcal Vaginitis

SIR,—I note with interest and appreciation Prof. O'Donel Browne's remarks on this method of treating gonococcal vaginitis and endocervicitis (Dec. 25, p. 816). This form of treatment is not new. Personally, I have used this method for a considerable time and must admit that my results in many cases are not "dramatic." Recurrences and drug-resistant cases are too common. I favour at present a short few-days treatment (oral as well as local), giving 3 g. sulphathiazole daily (divided 4-hourly) by the mouth with plenty of water, and vaginal insufflation once daily with approximately 2 to 3 g. around the external os and in the fornices. Close supervision is necessary.

Trichomonad infection coexistent with gonococcal infection is commonly found at the V.D. clinic. In such cases vaginal insufflations with "picragol" or with "acetarsol vaginal compound" powder or the nightly insertion of "S.V.C." tablet (stovarsol vaginal compound) are necessary long after sulphathiazole treatment has been stopped.

Many venereologists will have welcomed Prof. Browne's remarks on this form of treating gonococcal infections. The experiences and opinions of others would, I am sure, also be of value.—I am, etc.,

C. HAMILTON WILKIE,
Director of V.D. Services, Liecester.

The Septic Finger

SIR,—We have been following with extreme interest the correspondence on septic fingers. While we should like to reiterate Dr. Romer's well-conceived opinions, we find ourselves in disagreement with those of Dr. Bailey. We should like, therefore, to make the following comments:

1. Most of the fingers that we see are definitely "over-ripe" and less than 5% are at the stage of invasion.

2. We are extremely surprised that Dr. Bailey has not seen any cases with bone necrosis, and we should be very interested to hear if any radiographic investigations were made of suspected cases, as we have seen several in the last few months.

3. Although it is obviously desirable to reduce the number of out-patients, it is our experience that the majority of general practitioners have neither the time nor the facilities to treat these septic fingers after incision.

4. We would further point out that septic fingers rank high as a cause of loss of man-hours in war production and of permanent disability; thus the greatest possible care should be taken in their treatment.

5. We have found short-wave diathermy an excellent means of rapidly healing those cases of prolonged infection with or without early bone involvement.

It is possible that, being house officers in a hospital seeing only some 200 casualties a week, we have better opportunities than Dr. Bailey for continuing treatment of our septic fingers until they are completely healed.—We are, etc.,

M. V. P. THOMAS.
LEONARD L. MISTLIN.
CYRIL BORODA.

Watford.

Physics and the Surgeon

SIR,—I read with great interest the Bradshaw Lecture by Mr. H. S. Souttar (Dec. 11, p. 737) on physics and the surgeon. He states: "The radiation of which I am speaking consists of ether waves transmitting energy across space." I think it only fair to point out that there may perhaps not be an ether of space but just space (or space-time of relativity). With the

advent of Einstein's relativity, it has often been said that ether has been abolished. Ether merely is a convenient noun to describe the properties of space. It is often a convenient *grammatical construction* to have. If we persist in using the term ether, it should be understood as the *subject of the verb "to undulate,"* and acts as this subject fairly well. The term ether as understood by the old physicists is no longer believed by modern scientists.—I am, etc.,

Public Health Department, Gorseinon. G. E. DONOVAN.

Agents Provocateurs

SIR,—As there has been a good deal of controversy in connexion with this case, it would be interesting to know what obligations (if any) the two doctors who saw the "patients" in the second instance were under as regards the doctor who first dealt with them. Both of these practitioners knew that the decoys had been certified by another doctor, with whose opinion they disagreed; they also knew, presumably, that their findings were likely to be the basis of an action for lax certification against the first doctor. The question which arises is, Were they under any obligation to communicate with him before proceedings were taken?

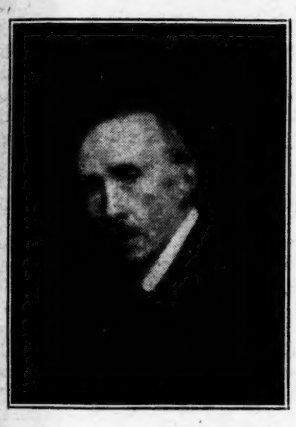
Considerable public interest has been taken in this case, the general opinion being that the accused doctor had a decidedly "raw deal" all round.—I am, etc.,

Leicester. E. J. O'SULLIVAN.

Obituary

C. E. DOUGLAS, LL.D., M.D., F.R.C.S.ED.

The death at St. Andrews of Charles Edward Douglas not only deprives the Scottish profession of one of its most respected and popular senior members but also robs both the medical charities of a highly valued supporter. After qualifying M.B. at Edinburgh University in 1877 he went on to the M.D. in 1881, the F.R.C.S.Ed. in 1898, and the D.P.H. in 1894. He had been resident surgeon at the Royal Infirmary, Edinburgh, and assistant physician at Morningside Mental Hospital. An enthusiastic Volunteer, he served in the South African War and in the war of 1914–18, reached the rank of lieutenant-colonel in the R.A.M.C.(T.), and held the Volunteer and Territorial Decorations. He practised at Cupar in Fife for many years and was M.O.H. for the burgh. When the British Medical Association held its Annual Meeting in Melbourne in 1935, Douglas was soon the admired doyen of the company: it was supposed that he reached the age of 80 during the outward journey, but this was clearly a mistake, as he had just not reached 88 at his death on Dec. 28, 1943. He was especially devoted to chess; and when he travelled home from Marseilles by air it was said that he spent the whole flight in the exercise of this pastime. His spare, almost shrivelled, form threw into relief the constant activity of his mind and body; and his instant popularity with both sexes and all ages was a wonderful tribute to his heart as well as to his head. Douglas was a vice-president of the Royal Medical Benevolent Fund. He was even more of a mainstay to Epsom College, of which he was also a vice-president, and an honorary local secretary over a period of very many years; his own subscription was kept alive for 50 years or more, and his collections from colleagues were further valuable evidence of his interest in education.



C. E. Douglas had long been a loyal B.M.A. man and did valuable work in his own neighbourhood, at the Scottish Office, and at headquarters in London. He was a member of the Central Council for 12 years, and of the Scottish Committee from 1923 to 1930 (chairman 1923–5); he represented his Division at 13 Annual Meetings of the Association, and served on the Journal Committee, the Insurance Acts Committee, the Ethical Committee, the Charities Committee, and the Parliamentary Elections Committee, taking a particularly keen and active part in the work of the last two committees through a long period of years. He was also a member of the special committee set up by the Council to inquire into the causation of puerperal morbidity and mortality. At the Edinburgh Annual Meeting in 1929 he held office as vice-president of the Section of Obstetrics and Gynaecology. He had been president of the Fife Branch in 1914, and in recognition of his long and distinguished service he was elected a vice-president of the B.M.A. in 1936.

On his retirement in 1927, when he celebrated the jubilee of his entry into general practice, Dr. Douglas received the honorary degree of LL.D. from Edinburgh University. He then made his home at St. Andrews, where he took a deep interest in the history of the town and in the administration of St. Andrews Episcopal Church; he was also a member of the Representative Council of the Scottish Episcopal Church. When he left Cupar a public ceremony was held in his honour, at which the Lord-Lieutenant of the County, Sir Ralph Anstruther, Bt., handed him a number of gifts from his many friends in Fife.

Dr. S. WATSON-SMITH writes:

As the years roll by we have to part wiith one notable member of the profession after another. Now we lament the passing of Douglas of St. Andrews. He was born at Cannanore in South India, the son of Col. Walter Douglas of the Madras Staff Corps, being, when he reached school age, sent home to be educated at the Edinburgh Collegiate School, then at the University of Edinburgh. While at school he won many long-distance races. On qualifying, Douglas became resident house-physician to Joseph Bell at the Edinburgh Royal Infirmary, and worked for a short time there as surgical assistant to Joseph Lister. Thereafter he spent six months at Vienna in postgraduate study. He began general medical practice as an assistant at Richmond, settling down in 1880 in practice on his own account at Cupar, Fife, having acquired the practice of the late Dr. James Mackie, whose youngest daughter he afterwards married. Soldiering was one of his greatest interests: for 40 years he served in the Volunteer Force, afterwards transferring to the R.A.M.C.(T.) when the Territorial Army came into being. For many years Douglas served as battalion medical officer of the 6th (Fifeshire) (The Black Watch) Royal Highlanders, spending his well-earned yearly holiday in training at camp. On the outbreak of the South African War he at once volunteered for service, being appointed M.O. of the 1st Battn. Worcestershire Regiment. During the war of 1914–18 Douglas served in France at H.Q., 51st (Highland) Division, afterwards commanding the casualty clearing station of the Division. Douglas was founder of the Fife Medical Society, being hon. secretary for the long period of 45 years; was a member of the Medico-Chirurgical Club, of the Harveian Society of Edinburgh, and of the E.R.I. Residents Club, being president of each of these at one time or other. At professional meetings he was often called upon to speak: addressing any meeting he was fluent yet concise and graceful, never diffuse, and always relevant; all his utterances were charged with common sense. He was an easy writer, contributing from time to time to the *B.M.J.* To the Harveian Society of Edinburgh he contributed "Two Medical Humorists"; to the Obstetrical Society there, "Observations on 70 Years of Country Midwifery Practice"; and he was an Alexander Black lecturer, choosing as his subject "The Family Doctor as Specialist."

To measure the good that Douglas did in his day is beyond doing—its extent is immeasurable. Each day of his working life was a full day, and his life a very full one. Practically the whole of his professional life was spent in Fife, which has cradled and given to medicine so many able men. Striving stoutly in his profession, he yet found energy and time for much else: he had an unusual power of work and of steady application. Belonging to a past generation, much of his work has faded from memory, but the good that he has done lives after him. What will live longest in the thoughts of his friends will be his amazing versatility and his high-souled character, for he had many lovable qualities. His wife died in 1939 after 57 years of married life; they were a most devoted couple, extremely happy in their home life. Of his two daughters one, Dr. Dorothy Douglas, is in medical practice in St. Andrews; the other is sub-prioress of the Convent at Bruges, so is for the time being completely cut off from home.

Mr. H. S. SOUTTAR writes:

To live to a great age is a doubtful boon; to enjoy to the end of a long life all that life has to offer is a rare achievement. In spite of his years Douglas never grew old, and to the very end he

retained an ardour and alertness that we all envied. A voyage round the world in a large party is an experiment that few men of 80 would care to undertake, but when the B.M.A. met in Melbourne in 1935 Douglas was there. No one enjoyed the journey more than he, and there was no more popular member of the party. He was a fine chess player with a consummate knowledge of the game which was always at the disposal of us all. At the end of our tour he wished to return overland from Marseilles, and I persuaded him to come with me by air. He only consented on the condition that we should play chess! I shall never forget his boyish delight in every detail of our journey, and perhaps I owed to that that we agreed to draw our game as we came down at Croydon.

Douglas took a deep interest in the Association and in all the problems of our profession, and I have recent letters from him showing that his interest was unabated to the end. We have lost a wise counsellor and a good friend, but he has left behind memories of deep affection and of high regard.

ROBERT OWEN MORRIS, O.B.E., M.D., D.P.H.

By the death of Dr. Robert Owen Morris in his 84th year Wales has lost one of her most notable public men. A correspondent sends the following memoir to supplement the notice printed on Dec. 25:

Morris's career began as a shop assistant at Portmadoc, Caernarvonshire, but deciding to enter the ministry under the auspices of the Welsh Calvinistic Methodists, he returned to school, and then passed through Bala College to Edinburgh. After ordination he ministered in North Wales and was a welcome visitor to the pulpits of both Welsh and English Presbyterian Churches, including those in the Liverpool district. He was a powerful and popular preacher in great demand at special services. On the eve of accepting a call to one of the most prominent churches in North Wales, he decided to leave the ministry and return to Edinburgh as a medical student. He continued preaching in the churches of the Scottish Presbyterians, and was offered ministries in Scotland and America. These he did not accept, but went on with his medical studies and qualified M.B., C.M. in 1894 and took the M.D. in 1898.

He began medical practice at Birkenhead in 1895. A year later he was elected to the school board and was actively associated with education in the borough, first as a member of the board and later as a part-time school medical officer. Though not politically minded, he was prevailed upon to seek election to the borough council as a Liberal, and was successful. The Conservatives were in power during his membership, and Morris, always a powerful and tenacious fighter, was continually in opposition to the leading party. To his amazement, therefore, he was approached by members of the Conservative party in 1902 to accept nomination as mayor of the borough. This he accepted, and served in that capacity in the year 1902–3. At the time he was also serving the council as a part-time school medical officer. The passing of the Education Bill in 1902 debarred municipal employees from becoming members of councils by which they were employed. So that Morris might complete his year as mayor, a special clause was inserted in the Bill enabling officers to continue serving on their councils until October, 1903. Nine days before his term of office expired Morris resigned. After this he interested himself in public health, and when over the age of 50 took the D.P.H. of Liverpool University.

In 1911–12, with the passing of the National Health Insurance Act and the establishment of the Welsh National Memorial Association for the Treatment of the Tuberculous, he was persuaded by Mr. David Davies of Llandinam (now Lord Davies) to undertake the campaign in Wales against tuberculosis. For this purpose he toured the whole of Wales, lecturing in city, town, village, and hamlet. His early training as a minister served him in good stead. Wherever he went he drew crowds. He was able to talk to the public in simple but forceful manner, and his illustrations were always to the point. In Morris's later years the writer sometimes accompanied him to meetings on health matters, and was astonished at the hold he always had on his audience, especially an audience of school-children. The campaign ended, he became director of education for the Association and tuberculosis officer for Montgomeryshire, and in 1926 he took over Merionethshire as well. In these two counties he worked until 1931, when he retired as tuberculosis officer but retained his post as director of education. During his work as tuberculosis officer he travelled always by train, and it is said that no train would leave without him if it were known that he was due to catch it.

On his retirement he lived at Aberdovey, later moving to Fairbourne and then to Llwyngwril, where he died. He continued his lecturing and travelled throughout Wales as in his early days, taking part in health weeks, etc. He was the author of many pamphlets on tuberculosis and a part-author of the Red Cross textbook on tuberculosis. His work as a lecturer and writer gained him his election as Fellow of the Royal Society of Edinburgh. He was awarded the O.B.E. in 1935, and his public services were also recognized by his elevation to the magisterial bench in the borough of Birkenhead and the counties of Montgomery and Merioneth. He was also appointed High Sheriff for Merionethshire. He served as a member of the Court of Governors of the University of Wales, Aberystwyth. As a propagandist in health matters Morris was among those few medical men who could speak to the lay public in simple non-technical language. He was equally at home in English or Welsh.

He was a most lovable personality, jolly and entertaining company, kind and considerate, and a fearless and tenacious fighter when the cause was just. His passing is mourned by many throughout the breadth of Wales.

T. W. D.

The Services

Temp. Surg. Lieut. J. Saint-Martin, R.C.N.V.R., has been mentioned in dispatches.

Surg. Lieut.-Cmdr. J. D. Lendrum, R.N.V.R., appears in a list of names published by the *London Gazette* as mentioned in dispatches for gallantry or good services in the last six months or more of war.

Wing Cmdr. J. P. Huins, O.B.E., A.A.F., and Acting Wing Cmdr. H. P. R. Smith, R.A.F.O., have been awarded the Air Force Cross.

Acting Wing Cmdr. C. C. Barker, R.A.F., has been commended for valuable services in the air.

The following appointments in recognition of gallant and distinguished services in the Middle East have been announced in the *London Gazette*:

C.B.E. (Military Division).—Col. J. R. Boyd, M.C., N.Z.M.F.; Brig. (local) G. W. B. James, M.C., Brig. (temp.) R. F. Walker, O.B.E., M.C., Cols. (temp.) R. H. Lucas, O.B.E., M.C., and D. C. Scott, O.B.E., R.A.M.C.

O.B.E. (Military Division).—Col. (temp.) R. McKinlay, Capt. (temp. Major) (acting Lieut.-Col.) R. J. V. Pulvertaft, R.A.M.C.

M.B.E. (Military Division).—Capt. (temp. Major) R. B. Robertson, R.A.M.C.

The *London Gazette* announces the appointment to O.B.E. (Military Division) of Major (temp. Lieut.-Col.) R. E. Tunbridge, R.A.M.C., and to M.B.E. (Military Division) of Capts. J. R. Bolton and J. J. Kempton, R.A.M.C., in recognition of gallant and distinguished services in Malta.

DEATHS IN THE SERVICES

By the death of Lieut.-Col. ALFRED ERNEST JOHN LISTER, I.M.S., on Dec. 21 at Stroud, Gloucestershire, the Service has lost a man of sterling worth. He studied medicine at St. Bartholomew's Hospital and in Vienna and passed both the London University M.B., B.S. and the conjoint examinations in 1900, held the Brackenbury Scholarship in Surgery and took the F.R.C.S.Eng. in 1902, and in the same year was placed first in the entrance examination for the Indian Medical Service. At the end of the Netley Army Medical School course he gained prizes in hygiene, surgery, and clinical medicine. Early in his career in India Lister saw active service in East Africa and Somaliland and gained a medal and clasp, and he was also on service during the war of 1914–18. He next entered the civil department of the I.M.S. and worked in various stations until he rose to be ophthalmic surgeon to the King George's Medical College at Lucknow when that school was opened. There by his sound professional knowledge and unassuming manner he gained the respect and affection of his colleagues, though he was handicapped by poor health, which led to his early retirement in March, 1920, before which he was appointed Hon. Surgeon to H.E. the Viceroy of India. For eight years he wrote the ophthalmic section for the *Medical Annual*. After his final return to England he settled in Bristol and was appointed honorary consulting surgeon to the Bristol Eye Dispensary and did some consulting practice, though still far from being robust in health; once more he gained the respect of his colleagues. He will be much missed by his many friends and admirers. Latterly he gave up his work in Bristol and went to live at Stroud. His wife and a daughter survive to mourn his loss.

Universities and Colleges

UNIVERSITY OF OXFORD

In a Congregation held on Dec. 18 the following medical degrees were conferred:

D.M.—P. M. F. Bishop.

B.M., B.Ch.—J. M. Hastings, A. I. M. Neill, W. B. Jack, R. H. M. Baines, J. V. Garrett, S. J. G. Spencer, R. W. Fynn, B. I. Johnson, J. Evans, D. W. K. Kay, F. I. Flint, W. L. B. Leese, G. I. M. Swyer, J. L. Insley, I. R. Stillman, Marcia I. P. Harvey.

No. 51

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Dec. 25.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1943 (a)	(b)	(c)	(d)	(e)	1942 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	53	6	22	2	3	64	3	15	1	4
Deaths		3	—				1	—		
Diphtheria	498	25	134	80	24	731	30	244	50	32
Deaths	9	—	4	2	—	14	1	5	1	—
Dysentery	96	29	69	1	—	103	15	43	—	—
Deaths				—	—				—	—
Encephalitis lethargica, acute	2	—	—	—	—	3	—	—		—
Deaths		—					—			
Erysipelas			55	3	—			66	4	4
Deaths		—					—			
Infective enteritis or diarrhoea under 2 years				9					25	
Deaths	43	2	4	1	1	23	3	10	12	2
Measles	363	36	53	28	—	10,888	300	332	10	13
Deaths	1	1	1	1	—	16	—	3	—	—
Ophthalmia neonatorum	66	6	17	—	—	60	3	12	—	—
Deaths										
Paratyphoid fever	1	—	—	—	—	3	2	2	—	1
Deaths	—	—	—		—	—	—	—		
Pneumonia, influenzal*	2,079	119	83	16	8	671	48	7	7	3
Deaths (from influenza)	690	80	48	5	8	38	5	1	—	1
Pneumonia, primary			511	20				227	6	
Deaths		124		9	17		33		9	10
Polio-encephalitis, acute	3	—				—	—			
Deaths		—					—			
Poliomyelitis, acute	5	1	—	2	—	7	1	3	10	—
Deaths		—					—			
Puerperal fever		1	10		1		—	12		—
Deaths		—					—			
Puerperal pyrexia†	105	4	22	1	2	111	7	17	—	2
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,786	87	242	25	84	2,054	98	372	41	51
Deaths	1	—	—	—	—	4	1	—	—	—
Smallpox	—	—	—	—	—	—	—	1	—	—
Deaths				—	—				—	—
Typhoid fever	2	1	1	2	—	6	1	1	6	—
Deaths	—	—	—	—	—	1	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Whooping-cough	1,244	99	130	21	16	837	51	29	47	7
Deaths	17	4	5	3	1	8	1	—	1	—
Deaths (0–1 year)	452	51	84	19	22	276	36	61	37	10
Infant mortality rate (per 1,000 live births)										
Deaths (excluding stillbirths)	7,011	1,122	787	237	175	3,776	503	560	142	104
Annual death rate (per 1,000 persons living)			17·7	15·6	‡			12·6	9·5	‡
Live births	5,606	676	799	230	222	4,320	547	720	187	
Annual rate per 1,000 persons living			16·3	15·1	‡			14·9	12·5	‡
Stillbirths	185	19	34			185	24	41		
Rate per 1,000 total births (including stillborn)			41					54		

* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Includes puerperal fever for England and Wales and Eire.

‡ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales* infectious diseases continue to decline in incidence, notifications of acute pneumonia being down by 514, of whooping-cough by 156, of scarlet fever by 150, of diphtheria by 52, and of dysentery by 37.

Deaths from influenza in the great towns dropped to 690 (and in the week ending Jan. 1 to 464). There were 80 influenzal deaths in London, 25 in Manchester, 25 in Sheffield, and 24 in Liverpool.

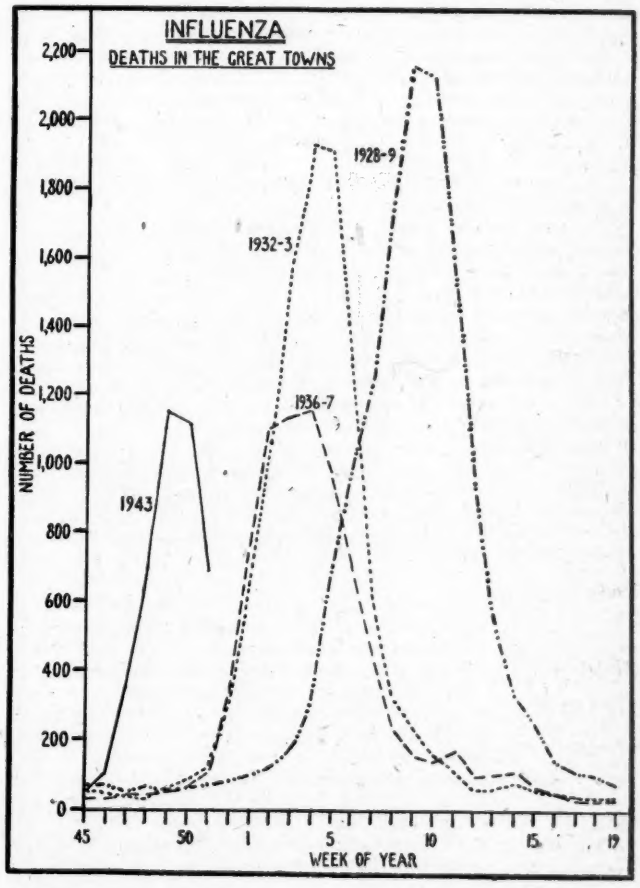
The lowered incidence of scarlet fever occurred mainly in the North, and also in London which recorded a drop of 58 cases. Notifications of pneumonia were down by 101 in London, and by 146 in Lancashire; in contrast to the general trend there was a rise in Yorks West Riding of 35 cases. Measles fell to a new low level, the largest returns being Lancashire 43, London 36, Durham 34.

The notifications of dysentery, though the lowest for over six months, were still relatively high. The chief centres were London 29, Lancashire 15, Kent 10, Essex 9.

In *Scotland* the only changes of note in the incidence of infectious diseases were rises in acute primary pneumonia 74, and dysentery 22. In Edinburgh notifications of dysentery rose from 20 to 54. The increase in pneumonia was in the western area.

Influenza

The graph below shows a comparison of the deaths recorded in the large towns during the present outbreak with those in the three largest recent epidemics. The shapes of the curves of the completed epidemics are similar—a rapid rise to a maximum and an equally rapid fall; the four outbreaks have approximately the same rate of increase, although the heights of the maxima vary. The most notable feature so far of the present



outbreak is that the rise began some weeks earlier than in recent epidemics. It remains to be seen whether the present epidemic will follow the usual course and disappear during what normally would be the height of the influenza season, or whether the trend will display some secondary rise.

Typhus in Naples

It has been reported that a rapid increase in the number of cases of typhus has occurred in Naples during the first week

of this year. The new cases have been estimated to be almost 100, and steps are being taken to prevent a major outbreak among the civil population. No case has occurred among Army personnel.

The Week Ending January 1

The returns of the notifications of infectious diseases during the week in England and Wales included: scarlet fever 2,029, whooping-cough 1,509, diphtheria 578, measles 546, acute pneumonia 1,997, cerebrospinal fever 73, dysentery 89, paratyphoid 5, typhoid 7. In the great towns 464 deaths were attributed to influenza.

Medical News

Dr. Geoffrey Marshall, O.B.E., F.R.C.P., physician to Guy's Hospital and Brompton Hospital, has accepted the invitation of Sir Walter Womersley to act as an honorary consulting physician to the Ministry of Pensions.

The Eugenics Society at its meeting on Tuesday, Jan. 18, in the rooms of the Royal Society, Burlington House, Piccadilly, W., will debate the proposition "That the programme of social security set out in the Beveridge report should be supported on eugenic grounds." Lord Horder will take the chair at 5 o'clock.

The National Council for Mental Hygiene has arranged a course of twelve lectures on "The Psychology of Frustration and Fulfilment in Adolescence" to be given in Caxton Hall, Westminster, S.W., on Tuesdays at 5.15 p.m., beginning on Jan. 18. Tickets for the course (£1; single tickets 3s. 6d.) may be had from the Secretary of the Council, 39, Queen Anne Street, W.1. The lectures are specially addressed to those with social and educational interests, and four of the lecturers are headmasters or headmistresses. The first three lectures, by Dr. J. A. Hadfield, are on "The Psychology of Adolescence."

The following meetings of the British Institute of Radiology will take place in the Reid-Knox Hall, 32, Welbeck Street, W.1, at 2.30 p.m.: Friday, Jan. 21, meeting of medical members. Saturday, Jan. 22, ordinary meeting at which the following papers will be read: "Intracavitary Radium Techniques for the Treatment of Carcinoma of the Cervix Uteri," by G. J. Neary, Ph.D.; "The Combination of Gamma- and *X*-ray Therapy in Carcinoma of the Cervix Uteri," by B. Sandler, M.D. Gynaecologists interested in these subjects are cordially invited to attend.

The next meeting of the Biochemical Society will be held at the British Postgraduate Medical School, Ducane Road, Hammersmith, W.12, on Saturday, Jan. 22, beginning at 11.15 a.m. Luncheon (on notification) at 1 p.m.

At a sessional meeting of the Royal Sanitary Institute to be held on Wednesday, Feb. 9, at 2.30 p.m., at 90, Buckingham Palace Road, S.W.1, Mr. W. McAuley Gracie, director of infestation control, Ministry of Food, will open a discussion on rodent infestation. Members and others proposing to attend this meeting are asked to notify the Secretary of the Institute by Jan. 28.

The eighth annual medical conference of the Ex-Services Welfare Society will be held at the Waldorf Hotel, Aldwych, W.C., on Tuesday, Feb. 8, under the presidency of Lord Horder. The proceedings open at 10.30 a.m., and the medical aspect is likely to loom largely in the discussion. This conference will be followed on Feb. 11 by a meeting convened by prominent industrialists and trade union leaders.

The seventeenth annual meeting of the Association of Clinical Pathologists will be held in London at Guy's Hospital on Friday and Saturday, Jan. 28 and 29, beginning each day at 9.15 a.m. A full programme of short papers has been drawn up for the morning sessions. On Friday afternoon there will be demonstrations followed at 4.30 p.m. by the presidential address by Dr. A. F. Sladden on "The Significance of the Laboratory." The honorary secretary is Dr. W. H. McMenemey, Royal Infirmary, Worcester.

Dr. A. B. Lindsay, medical officer, Indian Tea Association, has been appointed O.B.E. (Civil Division) for services in connexion with the Burma Campaign, May 21, 1942, to June 20, 1943.

The new address of the Central Council for District Nursing in London is 25, Cockspur Street, S.W.1.

Coloured labels will in future denote the various strengths and kinds of insulin: 20 units per c.cm. will have a buff label; 40 units a blue, and 80 units a green. The same colours will be used in combination with pink for protamine-zinc-insulin, and in combination with orange for globin insulin.

After an interval of four years the annual meeting of French gynaecologists was held on Oct. 16 in Paris, where the French Society of Gynaecology met on Oct. 10.

In September there was an epidemic of poliomyelitis in Amsterdam, 66 cases of which had originated abroad.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1.

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ANY QUESTIONS?

Clinical Estimation of B.M.R.

Q.—*Is there any method of estimating the basal metabolic rate clinically? I seem to remember hearing of a formula which depended on the estimation of the pulse rate and systolic and diastolic blood pressure. Can you tell me what the formula is, how it is carried out, and whether it is of value in estimating the progress of a case of hyper- or hypo-thyroidism?*

A.—There are several ways of estimating the B.M.R. without actually measuring it. The best-known is that of Read and Barnett. Where P.R. = pulse rate and P.P. = pulse pressure, the Read and Barnett formulae are: for men, calories per sq. metre per hour $= \frac{P.R. \times P.P.}{200} + 27$; for women, $\frac{3 \times P.R. \times P.P.}{700} + 24$. In order to convert these figures into B.M.R., they must be divided by the normal calorie production per sq. metre per hour, as given in Du Bois's chart:

Age	Males	Females
14–16	46	43
16–18	43	40
18–20	41	38
20–30	39.5	37
30–40	39.5	36.6
40–50	38.5	36
50–60	37.5	35
60–70	36.5	34
70–80	35.5	33

This method has some use in checking the progress of an individual patient. It is extremely unreliable for comparison between one patient and another.

Bartlett's method depends upon the breath-holding ability or duration of voluntary apnoea (D.V.A.). A person of normal B.M.R. is said to be able to hold his breath 1.8 to 2 times as long after inspiration as after expiration. In thyrotoxic patients the D.V.A. in both circumstances is reduced, but especially after inspiration. There is therefore a reduction in the ratio $\frac{D.V.A.\ In.}{D.V.A.\ Ex.}$. This method is so inaccurate that it is of no value except as a slight indication of an abnormal trend. Almost as unreliable is the "pulse-pressure pulse-rate index." The P.P.×P.R. of a normal person is said to lie between 2,880 and 3,000. It is probably true that the greater the deviation from these figures the greater is the probability of the B.M.R. being found to be abnormally high or low, but this is all that can be said for the method.

Neuritis with Osteo-arthritis

Q.—*A woman aged about 60, nullipara, for years has had osteo-arthritis in neck and back. Massage has recently improved this, and movements are comparatively free and painless. Lately a form of neuritis (?) has developed, chiefly in the left arm and especially the hand and fingers, more particularly affecting distribution of ulnar nerve. Salicylates improve matters to a certain extent only. Liniments are unsuccessful. After pain subsides numbness is felt, followed by pain when sensation returns to normal. No swelling or inflammation. No cramp. Pulse and pressure normal. The condition is intermittent. Would further local massage improve matters?*

A.—The symptoms in this case appear to be due to intermittent pressure on the cervical nerve roots as they pass through the foramina, and are not infrequently met with in slight degree in osteo-arthritis of the cervical spine. The pressure may be due to osteophytes in the vicinity of the foramen, or to narrowing of the foramina from thinning of the intervertebral disks due to the degenerative processes of advancing years, or to mild trauma. The thinning may be uneven, greater on one side than the other, or may

be associated with prolapse of the nucleus pulposus of the disk. The degree of compression is affected by posture. The absence of any mention of muscle-wasting in this case indicates that the pressure is not of a serious degree. It may be due to prolapse of a disk rather than to bony pressure. *X*-ray examination is desirable and should include profile and oblique views; the latter will often be found to give the clearest picture of the foramina. From the ulnar distribution of the sensory disturbances it is evident that the lesion affects the eight cervical and first dorsal roots. Sometimes the pressure is greater than the degree of bony obstruction will account for as seen in the radiograph, and it may then be due to soft-tissue changes or periosteal inflammation, which will later go on to calcification. As the movement of the spine becomes more limited by the bony outgrowths the pain may diminish. Treatment is not very satisfactory. Massage alone is not likely to be of much service, but associated with infra-red rays or short-wave diathermy may exercise a palliative effect. A supporting collar of leather or celluloid to carry the weight of the head and limit the movements of the spine would probably give a good deal of relief, but the remedy might be regarded as a more serious inconvenience than the pain. Surgical measures have been carried out with success in severe cases. A review of the subject under the title "Nervous Manifestations in Vertebral Rheumatism" appeared in the *Reports on Chronic Rheumatic Diseases*, 1935, **1**, 128.

Swollen Leg after Parametritis

Q.—*In March, 1942, a married woman aged 25 had her first baby by Caesarean section owing to obstructed labour. Severe parametritis ensued; treated with sulphonamides by mouth and intramuscularly. These were given into the left buttock and caused a good deal of pain. Convalescence was very prolonged, with white-leg on left side. This has gradually improved with massage, viscopaste bandages, etc., but the leg is still enlarged, heavy, and painful, especially thigh and buttock. There is no oedema, the swelling does not pit on pressure, and is soft and of fatty consistency. She has always had rather big, fat legs. Can anything be done for the relief of this condition?*

A.—These cases are difficult and often disappointing to treat. The thickening of the limb will certainly be permanent. Considerable relief of pain and aching would be given by expert massage. If the circulation in the limb is seriously impaired, then an improvement could be expected by a sympathectomy. The possible response to such treatment could be tested therapeutically beforehand by injecting the lumbar sympathetic on the left side. Segments 2, 3, and 4 are the ones concerned. It should be noted that encouraging results are now being obtained by this method of treatment in the acute phase of thrombosis. The prognosis in this particular case after such a long interval is not very good.

Intrameatal Angioma

Q.—*A boy aged 16 months has a small reddened area just inside the urethra. This bleeds and causes a good deal of pain on micturition. It is very resistant to treatment. Could you advise me as to treatment? The child was circumcised as a baby.*

A.—The description suggests that the condition is a small intrameatal angioma. As it is causing trouble it would probably be unsatisfactory to see what change time would bring about. If it is small it could be "diathermized" carefully without much fear of stricture. If so extensive that contracture would be a definite hazard of destructive treatment, irradiation must be used. There are obvious technical difficulties about the use of radium here in a small child, but with some ingenuity they could be overcome.

Angioneurotic Oedema

Q.—*I have a man in the middle fifties who gets the unsightly swellings of angioneurotic oedema on his lip, and I have given him a course of calcium. In severe cases an injection of adrenaline might remove the swelling, but obviously it should be used only where the swelling might cause danger to life. Is there any other treatment with any prospect of success?*

A.—An attack of angioneurotic oedema depends upon two groups of factors: (1) an allergic sensitivity, and (2) some incident which temporarily depletes or lessens the body's supply of adrenaline. The allergic sensitivities fall into three groups: first, drugs—commonly aspirin (usually taken for colds or headaches) and phenolphthalein (in aperients); secondly, feather, down, or horsehair bedding or pillows if the swellings begin at night or in the early morning, or dust if during the day; and, thirdly, certain foods. The adrenaline-depleting factors include worries, upsets, and sudden emotions, following acute or chronic illnesses, colds, and headaches. Hence swellings usually occur when a sensitive person gets a cold or a headache and takes an aspirin; when he develops a cold or an illness and is put to bed on feathers or down, or returns to some dusty job too soon after an illness; or following a gastro-intestinal upset and large quantities of certain gruels or cocoa-egg-milk beverages are given. In the treatment of the acute attack, 5 minims of adrenaline chloride (1 in 1,000 solution) should be given *at once* hypodermically, and 3 minims repeated each 1/4, 1/2, 1, or 2 hours until the swelling has gone down. Ephedrine hydrochloride, 1/2 gr., should be given every four hours at the same time. Calcium is of no value. A careful history to classify the case into drug, inhalant, or food group is essential; the use of skin tests, avoidance of indicated causes, or desensitization offer very good chances of success.

Hereditary Cold Fingers

Q.—*What is the treatment of arterial spasm in hands and feet of a married woman of 29? The condition, which has been present since childhood, appears as a reaction to cold, even to mild degrees of cold in the summer. The fingers, and sometimes the whole hands, become white and numb and painful, and the only way to restore the circulation easily is by immersion in very hot water. This is complicated in very cold weather by chilblains, which usually ulcerate and take weeks to heal.*

A.—In view of the early onset and the type of colour change the trouble should be regarded as "hereditary cold fingers" rather than Raynaud's disease. It is therefore unlikely to get more serious or to merit operative treatment, though it may well have been aggravated by wartime conditions. Cold and cold water should be avoided so far as possible. A warm room is desirable during the day, and a hot bottle or bed-socks at night. Warm clothing is essential, and the hands should be kept warm with gloves, muff, or a winter-warmer such as the "platinum pocket warmer." The skin of the fingers should be kept soft with a suitable grease, and cracks dressed with collodion or elastoplast. Drug treatment is unlikely to be effective as the disorder is basically a morbid constitutional response to cold. Calcium salts and thyroid still have their advocates, though at present nicotinic acid is in favour. It is given in a dosage of 50 mg. t.d.s., which may be increased if necessary up to 500 mg. a day.

U.V.L. from M.V.L.

Q.—*What is the present opinion of the value of ultra-violet light from a mercury vapour lamp as a therapeutic agent for maintaining health at this time of year, particularly in young growing children? How often should exposures be given, and what area of the body should be exposed on each occasion? Is blondness a contra-indication?*

A.—The value of general irradiation with U.V.R. can be ascribed to three factors: (*a*) vitamin D production; (*b*) esophylactic reaction; (*c*) psychological effects.

(*a*) To promote the first of these, which is of importance in the maintenance of health, particularly in children, the largest possible area of skin should be irradiated by exposing all aspects of the body. Suberythemal treatments should be given two to four times a week. As tolerance is not rapidly established with such doses, there is need for small increments only.

(*b*) The lethal action of U.V.R. can be made use of to provoke inflammatory reactions in the skin which, in the presence of antigens, appear to produce the elaboration of appropriate antibodies. A first-degree reaction over approximately one-sixth of the total body skin area should be aimed at and be repeated three times a week.

(*c*) The psychological effect can be enhanced by using a powerful source of luminous rays in conjunction with the M.V.L. and by encouraging relaxation during the treatment.

The so-called "tonic" effect attributed to "artificial sunlight" is probably due to a combination of the above effects. Blondness in itself is not a contraindication, but the thinness of the corneal layer of the skin, coupled with the inability to produce pigments so often encountered in these subjects, often makes them more sensitive to this form of treatment.

*** Esophylactic is defined in Dorland's *Medical Dictionary* thus: "Exerting a phylactive or protective influence from within, such as that of the fluids and cells of the body."

Plums and Apples

Q.—*What food value is there in plums? I believe the plum has a low vitamin C content, and it is popularly described as an acid fruit tending to irritate the gastro-intestinal tract. What are these acids? Are they harmful in any way, and what nutritional virtue is there in this widely distributed fruit? Incidentally apples are also lacking in vitamin C—with the exception of Bramley seedlings—and this raises the question of the nutritional value of the familiar mixture of plum and apple in pies and in jam.*

A.—Fortunately we still live on food, and not on vitamins. Most of us eat plums and apples because they have a pleasant and refreshing taste—in other words, because we like them. It is true that they contain very much less vitamin C than some other fruits, but this is no reason why we should scorn them. At the present time all foods which give flavour and variety to meals are of tremendous importance. Every housewife knows this and she rightly prizes such foods.

There is no evidence that plums, eaten in moderation, do the slightest harm to the majority of people. They may cause gastro-

intestinal irritation in a small number of persons; but what food is free from this objection? Experiments on healthy people showed that the amount of faeces passed when a large quantity of plums was eaten was no greater than when the diet contained no fresh fruit at all.

INCOME TAX

War Damage Claim—Assessor's Fee

A. F. lost some professional books, domestic furniture, and clothing by enemy action. The claim made has been accepted by the Board of Trade. A fee of 5% of the amount has been paid to the assessor. Can this be treated as an allowable deduction for income-tax purposes? He is assessed under Schedules A and E.

*** If A. F. is required to replace and use the professional books for the purposes of his employment—which, however, is apparently *not* the case—he can claim to deduct a proportion of the assessor's fee. Otherwise no claim can be made—he is in the position of a private citizen who has had to incur a personal expense.

Cost of Cars

"RURAL'S" husband is in the R.A.F. and she is running the practice, using two old cars owing to the impossibility of buying a new one. Is she entitled to the 20% allowance for depreciation on both cars?

*** The question is governed by Rule 6 applicable to Cases I and II, Schedule D, which provides for a "deduction . . . representing the diminished value by reason of wear and tear during the year of any machinery or plant used for the purpose of the trade. . . ." (This provision was later extended to professions.) If both cars are in fact used the allowance applies to both, and presumably will be based on the standard 20% of the written-down value.

Military Service Expenses

J. M. H. incurs certain expenses by way of subscriptions to associations and for professional literature. He has claimed to deduct the amount from his R.A.M.C. pay and has been refused.

*** Official pay is chargeable to income tax under Schedule E, and expenses to be allowable must be wholly, exclusively, and necessarily incurred in the performance of the official duties. Such expenses as those indicated are not regarded as necessary *in* the performance, etc. (however desirable as a means of preparation therefor), unless the subscriptions, etc., have to be paid to comply with a condition of the employment. We fear that J. M. H. has no alternative but to accept the position.

Assistant—Car Expenses

W. G. is an assistant receiving an allowance for the use of his own car. This brings his gross receipts over £600. Will that exclude him from the new system of tax deduction which comes into operation next April?

*** The £600 limit in the Income Tax (Employments) Act, 1943, applies to "emoluments." The amount allowed to an assistant because he uses his own car is not an "emolument" but merely the refunding of expenses incurred or accruing, and would not therefore be taken into account in dealing with the £600 limit. The way in which the limit works is that individuals whose emoluments *exceed* £600 are excluded, but it is to be inferred from statements in the House of Commons that in fact the limit will be abolished and will not operate in April next.

LETTERS, NOTES, ETC.

What is a Yawn?

Dr. B. H. KIRKMAN (St. Mary Cray, Kent) writes: The answer to this question (Nov. 20, p. 664) is in my opinion not altogether satisfying. Your correspondent considers that oxygen lack is the causal factor, but there is very little evidence that cerebral anoxia is operative in conditions under which physiological yawning occurs. It is much easier to alter the carbon dioxide content of the circulating blood under such conditions than the oxygen content. Further, yawning usually takes place under conditions favouring the accumulation of CO_2—e.g., after sleeping or in stuffy lecture halls. The accumulation of CO_2 in such conditions provides the necessary predisposition to yawning, while the example of others constitutes a precipitating factor. If CO_2 accumulation is the cause of yawning there is no need to postulate a depressant action on the upper levels of the respiratory centre. The direct stimulant action of CO_2 on the basal centres (respiratory, vomiting, vasomotor) is well known, through the work of Dale and Evans and others. It is well established, as your correspondent points out, that anoxia produces depression of cerebral activity, and it is equally true that oxygen intoxication produces epileptiform convulsions (Paul Bert and J. B. S. Haldane); but both of these phenomena occur well outside the physiological range of oxygen tensions. There is, so far as I am aware, no evidence to suggest that under normal conditions cerebral anoxia sufficient to cause definite depressive or release phenomena can occur. Your correspondent states that it is difficult to see any connexion between yawning in animals as part of an emotional reaction and yawning occurring in man and dogs under conditions of boredom. It is well known that a part of the emotional response in animals is an alteration in the rate and depth of breathing. Is it not possible that yawning in the "dilemma" situation in dogs is due to reduction of the respiratory output of carbon dioxide?

The importance of yawning in practical medicine is slight, but the discussion of its mechanism and genesis brings up the very important question of the excitability of the central nervous system in relation to gaseous tension and its bearing on the phenomena of epilepsy, tetany, ether clonus, post-encephalitic Parkinsonism, and catatonic schizophrenia. In epilepsy it has been shown that carbon dioxide exerts a depressant action on the cerebral cortex (Hill), and that its removal by overbreathing facilitates the onset of an epileptic fit. There is, so far as I am aware, no more experimental evidence to suggest that variations in the supply of oxygen to the brain are a causal factor in yawning than in epilepsy.

In conclusion I would point out that your correspondent does not mention one of the most consistent examples of yawning—namely, that which occurs immediately after the intravenous injection of pentothal and amytal. This response is so rapid that it cannot be attributed to any alteration in the gaseous balance and must be considered to be an example of a release phenomenon such as your correspondent envisages.

Relief of Thirst

Col. E. C. HODGSON, I.M.S. (ret.) writes: Having read your review of Dr. Macdonald Critchley's book *Shipwreck Survivors* (June 12, p. 726) and realizing, in part at least, the terrible torture of thirst in the Tropics, after 35 years in various parts of the Tropics—India, the Sinai Desert, and above all a summer in the Jordan valley with no protection, even of a tent, from the sun in 1918—may I mention the greatest immediate relief that can be obtained from inordinate thirst? The body should be soaked in a bath or the sea, and within 5 minutes the inordinate thirst vanishes to a mere desire for a small glass of fluid, and the lips and tongue become moist again, instead of sticking to the teeth and roof of one's mouth. I see in your review that Dr. Critchley mentions a 50% survival rate after 32 days' almost entire submersion; I suggest *because* of almost entire submersion. Medical field research work in the open on malaria, plague, and cholera during the hot weather in India, etc, where to drink the local water supplies would soon make one a casualty, has at least shown what thirst can mean; and the amazing sensation of relief that quickly follows immersion of the skin in water shows where the cry for fluid comes from in the body.

Treatment of Paronychia and Subungual Sepsis

Dr. W. H. PALMER (Hayle, Cornwall) writes: Until now, among the most discouraging of minor septic ailments have been cases of paronychia with commencing subungual sepsis. No matter what was done the condition almost always spread further and further under the nail, and it was lucky if one had to do no more than remove the nail to prevent or cure even deeper or wider mischief. It meant also to the manual worker a period of disability generally adding up to weeks. The trouble usually starts with a crack or tear in the cuticle, and generally in the corner, which gets red and inflamed, and then a bead of pus can often be expressed by gentle pressure from under its edge. For the last year I have been treating these cases by the following method, and have not had to remove a nail, and only rarely incise anywhere. The condition has been cured rapidly, sometimes in only a few days. The fact that pus had really been under the nail is proved by the destroyed area of nail showing as it grows up to view.

Attention to the following details is important, but the whole process takes only a few minutes. (1) The cuticle is gently raised off the nail by a blunt, flat-pointed instrument, or back edge of a scalpel near its point. (2) Gentle pressure is tried to see if pus comes, which is then wiped away with cotton-wool. (3) Pulv. sulphanilamide-P is gently pressed under the raised cuticle edge as deep as it will go in without causing real pain, and a little heap left all round the cuticle edge. This takes less than half a tablet. (4) A narrow piece of elastoplast gauze is then put over that heap of powder and round the digit, leaving top and bottom edges free. (5) The whole *must be kept quite dry*. (6) The above process is repeated daily at first, and later at intervals of two or three days, until no inflammation is visible. (7) If obvious pus is there which doesn't come out from under the cuticle a small incision may be necessary. The comfort and speedy cessation of pain or throbbing are remarked on by the patient, generally within 24 hours. Possibly sulphathiazole would do as well, or even better, but the results with sulphanilamide-P have been so good that I have not tried anything else.